CORRECTED

REPORT OF PROCEEDINGS BEFORE

GENERAL PURPOSE STANDING COMMITTEE No. 5

INQUIRY INTO THE M5 EAST VENTILATION STACK (2002)

¾ ¾ ¾

At Sydney on Monday, 18 November 2002

¾ ¾ ¾

The Committee met at 9.00 a.m.

¾ ¾ ¾

PRESENT

The Hon Richard Jones (Chair)
The Hon Jan Burnswoods
The Hon Amanda Fazio
The Hon John Jobling
The Hon Malcolm Jones
The Hon Peter Primrose
The Hon John Ryan

CHAIR: Thank you all for coming here for the second hearing of the Committee's inquiry into the M5 East ventilation stack.

I want to begin by making a short statement about security and about audiences at public hearings. I apologise to those in the audience who heard this on Friday. Unfortunately, as a result of the current world situation, particularly since the tragedy in Bali, security measures have had to be upgraded at this Parliament House, as at other prominent public locations. Public hearings are affected by this, as are other activities at Parliament House. I ask you to cooperate by following any instructions given by Parliamentary officers or security officers during today.

Apart from the general security issue, there are some things I need to say about your role as the audience today. When a large group attends a public hearing about an issue that vitally affects their lives it is often very hard to sit and listen silently. However, a Parliamentary hearing is not like a local council meeting where the audience sometimes makes comments and claps or interjects. In a Parliamentary hearing, members of the public are able to listen but not participate or interject. Order must be maintained at all times. It is important that members of the Committee can be heard and that witnesses can be heard. You also cannot directly approach the Committee members during the hearing.

To make sure that you can hear, as an audience, the Parliament has hired PA equipment for this hearing. You also have an important role to cooperate to ensure that witnesses and Committee members can be heard. If anyone interjects I will call them to order and, if necessary, they may be asked to leave. If you do not hear something of what is said it will be available in the transcript of the hearing. This transcript is usually published by the Committee and placed on its web site, so you will be able to check what was said. The transcript takes some time to be prepared and checked, so it should be on our web site some time this week.

Finally, in the afternoon we will need to change rooms for the hearing. The hearing in the afternoon will be held in rooms 814-815, which are in the non-public area of Parliament on the eighth floor. If you wish to attend you will need to get a visitor's pass from the Legislative Council front desk and you will be escorted in groups by the Parliamentary attendants. To make sure that there is not a last minute rush I would ask everyone please to cooperate by attending the Legislative Council desk at 2.15 to get visitors' passes.

For the media present I also remind you on behalf of the Committee that the usual broadcasting guidelines apply. Copies of this are available at the table at the door, as are copies of the terms of reference for this inquiry. It is important that you have regard to the provision of not filming the audience during the hearing.

For the rest of the audience I also need to let you know that you are not permitted to take photographs during the hearing unless the Committee has agreed to it previously.

NICHOLAS FRANK GREINER, Chairman, Baulderstone Hornibrook, 139 Macquarie Street, Sydney;

DAVID LAWRENCE TUCKER, Operations and Maintenance Manager M5 East, Baulderstone Hornibrook Bilfinger Berger, 101 Miller Street, North Sydney, and

CRAIG JOHN BURRELL, Consulting Engineer, Hyder Consulting, 181 Miller Street, Sydney, sworn and examined:

CHAIR: Are you conversant with the terms of reference for this inquiry?

Mr GREINER: Yes.

Mr TUCKER: Yes.

Mr BURRELL: Yes, I am.

CHAIR: If you should at any stage during your evidence consider that, in the public interest, certain evidence or documents you may wish to present should be seen or heard only by the Committee, the Committee would be willing to consider your request, but it may be overturned by vote of the Legislative Council.

Mr Greiner, would you like to make a short statement?

Mr GREINER: Yes, thank you, Chairman. I am here because it seemed appropriate to the company that someone from the board represent Liam Ford, the chief executive, who is overseas, and my colleagues on either side, one who is part of the group and one who is a consultant, are obviously here because they have some technical expertise on the tunnel a little greater than mine.

I should note that I have given the staff pages 13 and 15, which are replacement pages for our submission. The changes that are made are essentially as to dates, they are not substantial, but there are copies available.

Briefly, as we see it, the Committee is doing two things, one of which we can help with and one of which is not in our ambit. To the extent that you are following up your earlier report, clearly that concerns issues which we are not directly involved with or responsible for. We are, however, directly involved and responsible for the operations of the tunnel, which are almost precisely about to reach 12 months, and really our submission, which I am sure you have read, is essentially about the performance of the tunnel over the last 12 months and about the learnings or the improvements, if you will, that we think are available. I think they start at about page 15. We think that is probably the appropriate focus, but we are happy to answer any questions you like.

To state the obvious, Baulderstone Hornibrook is the operator. We essentially manage to standards laid down by others, by regulators essentially, but in practice it is clear that the operator works together with the regulators, with the RTA, with the various other parties that have given evidence or are about to give evidence to you.

Very briefly, in terms of the key messages we have extracted from our submission and what I think are the key points, the tunnel is operating safely and it is operating effectively. The carbon monoxide levels are now well below goal during the peak periods, despite several above-goal readings during the post-commissioning phase. Those readings did not result in any motorist being exposed to unsafe conditions. The above-goal readings were a result of faulty equipment and inadequate operating procedures and reflect what might be considered a normal post-commissioning environment. Traffic management procedures have been improved resulting in reduced lane closure time due to incidents despite substantially increasing traffic volume. The visible smog in the tunnel is well below health minimums and is not a measure of unsafe air quality. Finally, and perhaps to state the obvious, the M5 as a whole is coping with higher than expected traffic and it includes a high level of incidents and breakdowns and, despite that, it is open well in excess of 99

percent of the time.

I think the final point I would make, Chairman, is that we certainly do not pretend that there is some absolute state of perfection. Each tunnel, as will be apparent to the Committee, is essentially unique. It is also a unique part of the overall road network of Sydney, so there are clearly improvements over time; there are changes over time. It is an evolutionary situation and a learning situation and it would be pretty idle of us to pretend otherwise. Nevertheless, by way of conclusion, we think that the first 12 months of operation of the tunnel have been satisfactory or above satisfactory in every reasonable way.

My colleagues do not propose, I think, to make a preliminary statement. We are happy to answer any questions that you and the Committee may have.

CHAIR: On page 10 of your submission you talk about visibility. Are you aware of the formula which would convert that visibility in micrograms per cubic metre?

Mr BURRELL: Yes, I am.

CHAIR: Could you tell me then what .05 converts to in micrograms per cubic metre?

Mr BURRELL: .005?

CHAIR: .005, yes.

Mr BURRELL: I would suggest approximately - and it depends - 1000 micrograms per cubic metre.

CHAIR: Do you know what the ambient air standard is outside the tunnel?

Mr BURRELL: Yes, I do.

CHAIR: What is that?

Mr BURRELL: For particulate matter of PM10, 50 micrograms per cubic metre, 24 hour average.

CHAIR: The air inside the tunnel is 50 times the ambient quality outside.

Mr BURRELL: That would be a fair statement.

CHAIR: So if you were to take seven minutes to go through the tunnel, and seven minutes back, what would that average throughout the day for your intake of particulate matter?

Mr BURRELL: May I ask: Is it on an exposure basis that you are asking that question?

CHAIR: Yes.

Mr BURRELL: Well, assuming the in-tunnel average is, let's say it is peak for the sake of argument, 1000 micrograms per cubic metre, if one was exposed making two trips a day, each way, let's say 12 minutes, because at 20 kph you would travel the four kilometres in 12 minutes, at that level you would have an exposure of, say, 24,000 microgram minutes. External air quality goal, if you are treating it as an exposure basis, gives you 72,000 microgram minutes. There is a residual for each motorist making that type of trip of approximately, say, 46,000 to 50,000 microgram minutes, which in turn equates to an external average PM10 level of around 30 micrograms per cubic metre, so I would suggest that on an exposure basis, assuming that that was the appropriate way to assess the health risks in-tunnel associated with PM10 or particulate matter, that does not demonstrate that a motorist is exposed beyond the external air quality goal.

CHAIR: During that time alone, if they have no further exposure during the other 23 and a half hours?

Mr BURRELL: No, there is a residual. Even after making those two journeys there is still a residual with which they may be exposed externally.

CHAIR: The average over a 24 hour period for, say, six or seven minutes' exposure at 1000 micrograms per cubic metre within the tunnel added to, say, an ambient air quality outside of 40 would surely put a motor cyclist or a motorist with the top of their car down over the 50 limit?

Mr BURRELL: Not necessarily. If you look at the data in-tunnel, that is a peak value and those values that I assume you are quoting come from the stack monitoring data and that is not the actual value within the tunnel at all points in the tunnel, similar to CO.

CHAIR: Not all points, no, but certainly it gets up to 1500 micrograms per cubic metre on some occasions, does it not, and even up to 2000 sometimes?

Mr BURRELL: I would suggest not up to 2000.

CHAIR: What is then, for example, .01? Presumably it is 2000.

Mr BURRELL: Correct.

CHAIR: You have a chart here which shows .01. It is page 10 of 20 and just a few weeks ago it went over .01.

Mr TUCKER: That actually relates to the incident where there was a fire within the tunnel and the deluge system was operating and that is why those visibility readings are at that level.

CHAIR: What about .0087 then? I am assuming it is .0087, it is over .008 and below .009. Was that when there was a fire too?

Mr TUCKER: There are a number of readings that we have identified in that table where the instrument was out of calibration, so they are not correct readings.

CHAIR: Is that the same with the other ones then? All these peaks are freak peaks, we might say?

Mr TUCKER: That is correct, those ones identified where the instrument was out of calibration.

CHAIR: The average would appear to be something like .004, which is about 800 micrograms per cubic metre on average. Do you actually measure the particulate matter or do you just use visibility as a guide?

Mr BURRELL: No, we do not measure PM10s within the tunnel.

CHAIR: Rather the majority of this particulate matter is from diesel?

Mr TUCKER: That is correct.

CHAIR: Are you also aware 80 to 90 percent of diesel emission is below PM2.5?

Mr TUCKER: I understand, sir.

CHAIR: You would also be aware PM2.5 is far more dangerous to human health than PM10?

Mr TUCKER: I am not qualified to respond.

CHAIR: Have you read literature on the effect of PM10 and PM2.5 on health?

Mr BURRELL: I am aware of research and literature on that.

CHAIR: You would be aware of The Sick City study?

Mr BURRELL: Broadly.

CHAIR: You do not have detailed information as to how dangerous or otherwise particulate matter may be or how much more dangerous PM2.5 is compared to PM10?

Mr BURRELL: My understanding, and this is not my area of specialty, is that predominantly we are talking long-term exposures.

CHAIR: You would not be aware there is no known lower limit for exposure for health impact for PM's; there is no known safe limit for exposure to PM's?

Mr BURRELL: I could not comment I am not aware.

CHAIR: Do you monitor for benzene, a class 1 carcinogen??

Mr TUCKER: No, it is not a requirement.

CHAIR: Do any of your employees go inside the tunnel at any time?

Mr TUCKER: Yes there is a requirement in response to an incident or maintenance activity.

CHAIR: Would it not be incumbent upon you to have a duty of care to your employees not to expose them to unsafe levels of benzene, formaldehyde and particulate matter?

Mr TUCKER: Indeed the health and safety of all workers and motorists is of paramount importance to us.

CHAIR: Yet you do not measure for these dangerous gases inside the tunnel?

Mr TUCKER: No we do not measure on an ongoing basis.

CHAIR: Do you not think it would be a good idea for the occupational health and safety of your employees to make sure they are not exposed to high levels of benzene, formaldehyde and particulate matter particularly PM2.5's?

Mr TUCKER: There is a study being conducted on a short-term basis to understand it in relation to peak periods. Those results are not available.

CHAIR: Mr Greiner you said in today's Sydney Morning Herald that this hazy particulate matter is safe. Are you aware of medical literature available that particulate matter is as unsafe as tobacco smoke?

Mr GREINER: No I am not aware of that. Clearly I can only go the same way as the Committee on the weight of the expert evidence that I have read. The point I was seeking to make was that there was a clear difference between what seems to be a public conception the particulate matter is not that but carbon monoxide and people are driving through a visible poisonous gas when clearly that is not the case.

CHAIR: You are not saying particular to matter is safe?

Mr GREINER: I would not seek to think I was an expert on that.

CHAIR: You have come to give evidence today. You knew that visibility and particulate matter had been raised on a number of occasions. Would it not have been a good idea to be appraised on the problem of particulate matter?

Mr GREINER: I think I am appraised more than adequately for my position.

CHAIR: You have good advice either side of you but they do not know the level of particulate matter, they do not measure it they are only going by the visibility conversion for which there is a well known formula which is being used, but they are not monitoring for formaldehyde, benzene or other particulate matter in the tunnel. As chairman of this company I would have thought it was incumbent upon you to make sure conditions for your employees within the tunnel were safe and you simply do not know.

Mr GREINER: I accept what Mr Tucker said that clearly the safety of our employees has to be a primary concern of the company. I would imagine, although I do not know first-hand, we do everything required of us by law and if there is more required, as I said in my remarks. Clearly it is the whole question of tunnels, safety and the issues you are looking at and it is an ongoing area of learning. If at some future time that is considered required or desirable we would obviously do it. I do not think there is any suggestion we do other than meet all of the existing OH & S requirements.

CHAIR: If you were required by Planning NSW or EPA to put in ESP's within the tunnel, would you demur or would you go ahead?

Mr GREINER: Our general position, as I said in my introductory remarks, is obviously that we would consider we are a faithful and competent contractor and if asked to produce particles of gold dust we would do our very best to achieve that as long as our client was willing to pay. It is a straightforward situation. We are not the determinants and it is unreasonable of you to try to put us in the position, if you are, of determining the appropriate standards or tests. We initially bid to - and then managed to - standards given by people whose job in life it is to set the standards. The answer to your question, from my helicopter view, is yes we will do whatever we are required to do at a point of time; it would be unusual if we did otherwise. Essentially our task is to manage and perform to the standards that have been set. As we say in our submission that is exactly what we are doing.

CHAIR: If you felt your employees were at risk from particulate matter or benzene inside the tunnel, you would want to take steps to eliminate that or reduced that?

Mr GREINER: I think that is a reasonable assumption, if we thought our employees were at risk from anything we would want to take action.

CHAIR: If motorists were at risk would you not be concerned about that or that would not be your brief?

Mr GREINER: Clearly there is a different level of responsibility for that. We would assume, and I am sure it is the case, RTA, EPA and NSW Health, and no doubt many other regulators, would be very interested in that issue. From our perspective, as I said in my remarks at the outset, no motorist has been exposed in terms of health.

The Hon. PETER PRIMROSE: So I am clear I would like to give you an analogy, last week the Government proposed that restaurants that use MSG be required to advise their patrons of that fact. In this Upper House The Hon. Richard Jones and others decided that people such as myself who have an affliction to that do not have a right to be told, therefore you cannot go to the Chinese restaurant and say: It is your fault for not telling me; because there is no requirement. That is the same situation, you are relying on the regulators to set the limits, so it is our responsibility I presume?

Mr GREINER: That is exactly right, Mr Primrose, that is our view of the situation.

The Hon. MALCOLM JONES: When the design specifications were drawn for both air quality and construction of the tunnel were you consulted, as a likely tenderer, during the design phase?

Mr BURRELL: You are suggesting the air quality specifications laid down as the conditions of

approval?

The Hon. MALCOLM JONES: Yes.

Mr BURRELL: Were we consulted during the tender design phase?

The Hon. MALCOLM JONES: Yes, as an organisation with experience in the construction of tunnels were there any meetings whereby you were consulted about specifications for the air quality?

Mr BURRELL: In our capacity as tenderer for the project no we are not consulted during the bid phase as far as the conditions are concerned.

The Hon. MALCOLM JONES: When the tunnel was first proposed there were to be three stacks along the ridgeline; then the whole was re-jigged for political reasons to put the stack into a valley. During the changes in the design of the air filtration system and channelling of the air in long underground tunnels, was your opinion sought about any changes to the specifications for air quality and likely outcomes given those changes?

Mr BURRELL: No during the bid phase that would be inappropriate in terms of probity.

The Hon. MALCOLM JONES: Notwithstanding the fact the design changed once the original specifications were determined?

Mr BURRELL: No the change to the stack configuration would have been, to my understanding, imposed on each of the contractors bidding for the project and they in turn would have submitted tenders accordingly.

The Hon. MALCOLM JONES: My colleague talked about haze in the tunnel. For the sake of clarity would you be able to tell us what the haze consists of?

Mr BURRELL: The haze in the tunnel is predominantly particulate matter.

The Hon. MALCOLM JONES: Made up of or caused by?

Mr BURRELL: Caused by emissions from diesel vehicles.

The Hon. MALCOLM JONES: Why is the haze in the M5 East tunnel, which is a long tunnel, worse than the Sydney Harbour Tunnel?

Mr BURRELL: Simply because of the significantly increased percentage of diesel vehicles that characterise the fleet that use the M5 East compared to Sydney Harbour Tunnel.

The Hon. MALCOLM JONES: You would say therefore the ventilation systems in the Sydney Harbour Tunnel and the M5 East Tunnel are similarly efficient?

Mr BURRELL: To the extent or intent for which they were designed, yes.

The Hon. MALCOLM JONES: We are hearing a lot about the tunnel having to perform at levels higher than expected. Given that we have only a four-lane tunnel carrying such levels of traffic in excess of expectation, in your projections and modelling how long would it take before this tunnel is likely to become overloaded?

Mr BURRELL: Volumes of traffic may increase however the system capacity is size-based on the peak hourly flow, which is at capacity. Therefore the suggestion that increasing traffic beyond the current shoulders is going to exacerbate the situation, I would suggest is not correct in the context that this matter is going to get worse.

The Hon. MALCOLM JONES: I am not necessarily talking about air quality, I am talking about the actual weight of traffic going into the tunnel, it is a four-lane highway, it is having to perform in excess of expectation after one year's usage. How long before the traffic in the tunnel would be considered to be overloading that tunnel?

Mr BURRELL: As I said the tunnel is operating at capacity on an hourly basis now.

The Hon. MALCOLM JONES: Any further increment in traffic load, you say, will overload the tunnel?

Mr BURRELL: No, I did not say that, I said increase in traffic will occur in hours beyond the current peak hours, which is where the overall increase in traffic volumes will derive from.

The Hon. MALCOLM JONES: We are reaching a stage at certain hours of the day where the tunnel would be deemed to be overloading.

Mr BURRELL: No, not overloading, operating at it design capacity.

The Hon. MALCOLM JONES: Went would you anticipate it would be in excess of design capacity, assuming there are going to be growths in usage, growths in numbers of vehicles on the road, growths in population and so on? Would it be in a year, five years or next month?

Mr BURRELL: I could not actually answer that because it depends on the overall traffic network in terms of traffic beyond the current peak periods.

The Hon. MALCOLM JONES: So are you telling us then that you do not know, on modelling, the adequacy into the future of the capacity of this tunnel?

Mr BURRELL: Not on hand, but I could take that on notice and provide further information to the Committee if it requires.

The Hon. MALCOLM JONES: Yes, please. This is the third inquiry we have had into the M5 East Tunnel and you are not responsible - and I am not pretending you are - for the design specification of the tunnel; however, prior to the tunnel's construction, it was anticipated that there would be health problems for the residents in the vicinity and the tunnel has been opened, it has been operating for 12 months now or nearly 12 months and the health problems have been realised. The evidence which you have given would indicate that there is no basis for such health problems because the tunnel is operating to design specifications.

The Hon. PETER PRIMROSE: Can I make a point of order? You just made a statement there that health problems have been realised.

The Hon. MALCOLM JONES: Yes, we have received evidence from members of the community, under oath, to say that their health is deteriorating.

CHAIR: There is no point of order. Continue with your question.

The Hon. MALCOLM JONES: I would like to ask you who is right and who is wrong?

Mr GREINER: I think I can answer that because I have no technical expertise and the answer is that we do not know and, frankly, if we did, we would not say. You in fact gave the answer in the introduction to your question. You cannot expect us to seek to take on the role of regulator. We have spent the last 15 years in this State trying to separate the roles of regulator from the roles of people executing things, so we do not know the answer to the question as to who is right or wrong and, frankly, I would resist very much, if my colleagues or anyone else in the company wanted to give you an answer they would be told not to. It clearly is not our job and if you confuse those roles you end up in a totally hopeless situation.

The Hon. JOHN JOBLING: To put it simply, just for my benefit, if I was to describe Baulderstone Hornibrook, you would describe yourself as perhaps the builder and the operator of the tunnel?

Mr GREINER: I think that is fair, yes, that is what we bid to do and that is what we did in the case of building and we are now operating for the time of the contract.

The Hon. JOHN JOBLING: The RTA operates one segment of the technical side and Hyder, as I understand it, who is employed by you or consults to you both, deals with the air filtration side of it?

Mr BURRELL: Yes, Hyder is the designer.

The Hon. JOHN JOBLING: What I am interested in is, if the Committee, and if so the Government, resolves that air filtration equipment or electrostatic precipitating equipment was to be installed in the tunnel, under your contractual operational role, who would be responsible for paying for that?

Mr TUCKER: If the RTA gave us a direction to do that, we are obliged to follow that direction.

The Hon. JOHN JOBLING: That does not answer the question. What I am interested in knowing is: Is Baulderstone Hornibrook, as the operator, responsible on that direction for payment for the increased equipment - and, if so, one would suspect the toll would go up - or is the RTA responsible, or some other body, for paying for it?

Mr TUCKER: Any such direction would constitute a change. Firstly, there is not a toll, so it is a matter that the RTA would have to pay.

The Hon. JOHN JOBLING: What you have said then is that Baulderstone Hornibrook is not responsible for costing such an increase. Can I just look at the haze, and drawing down on some memoranda - and I suspect Mr Burrell is the person to whom the question should be put - I understand that you raised two specific issues currently in discussion to be addressed. One was in-tunnel visibility and the community perception relating to particulate/smoke haze in the tunnel and, secondly, portal emissions as a potential long-term operating strategy as anticipated in the supplementary DUAP condition 78/3.

Mr BURRELL: May I look at that piece of information?

The Hon. JOHN JOBLING: It is your memo of Friday, 17 May.

Mr BURRELL: I would certainly appreciate the opportunity to read that.

The Hon. JOHN JOBLING: I will pass it to you very briefly. Whilst we are dealing with that and you are having a quick glance at that, have you received any directions or requests from the RTA to operate a lane shutting program as a means of reducing pollution in the tunnel?

Mr TUCKER: No.

The Hon. JOHN JOBLING: None whatsoever from the RTA, none from the EPA or any other body?

Mr TUCKER: There has been no direction.

The Hon. JOHN JOBLING: That is interesting. Have you had any specific discussions on portal emissions or the change on portal emissions with the RTA?

Mr TUCKER: There have been discussions with the RTA on portal emissions.

The Hon. JOHN JOBLING: Where does this take us back to in the original document relating to control of emissions or restriction of portal emissions? Are you saying to me that you are now working on the

basis of being able to use portal emissions at the four portals?

Mr TUCKER: Portal emissions are provided for in response to incidents and select maintenance activities.

The Hon. JOHN JOBLING: So there is no program or proposition that you have, and I will come back to Mr Burrell in a moment when I have his memo back, in relation to how you might do it on a regular basis?

Mr TUCKER: Not at this stage.

The Hon. JOHN JOBLING: Would you explain to me how your original modelling and design specifications still apply, based on some 70,000 to 73,000 vehicles a day, which on average now are running at 82,000 and have hit 92,500? How is your modelling of particulate emissions and other gaseous emissions still valid and what have you done to upgrade your technical specifications?

Mr BURRELL: I am sorry, Mr Jobling, may I have that question again?

The Hon. JOHN JOBLING: Basically there is about a 20 percent increase in traffic volume, heavy diesel vehicles being the bulk, which is far in excess of your modelling. What new modelling have you done to deal with this very large increase at this very early stage?

Mr BURRELL: I think, as I explained earlier to Mr Jones, the peak traffic currently experienced on an hourly basis is adequately catered for by the ventilation system. Increases in traffic that you have just quoted have been predicted to occur.

The Hon. JOHN JOBLING: But that is in about 10 or 15 years' time.

Mr BURRELL: And they will occur beyond the current peaks because at this present point in time the tunnel is operating at capacity during peak hours.

The Hon. JOHN JOBLING: In your memo, Mr Burrell, you deal with what is interestingly called the reduction in the extinction co-efficient. Simply put, getting rid of the hazy appearance in the tunnel can be accomplished in two ways: Increasing the rate of dilution with additional fresh air brought in from outside the tunnel and reducing the quantum of particulate emission within the tunnel. Do you still agree that they are the two major ways of dealing with it?

Mr BURRELL: Correct.

The Hon. JOHN JOBLING: In your submission, with the current deed of obligation relating to portal emissions, with the limited availability of mechanical equipment, hence exhaust, obviously there is, in my view, a limited opportunity to reduce the rate of dilution in in-tunnel particulates. Again, a fair conclusion?

Mr BURRELL: For the purposes of addressing the perception of haze within the tunnel in the context of what you have just described, the answer is no.

The Hon. JOHN JOBLING: Pity, because they are the words in your briefing note. What would you say then about this: The portal emissions alone will not respond sufficiently to reducing the extinction co-efficient in order to mitigate the current perception?

Mr BURRELL: Yes, correct, I have stated that portal emissions will not assist in that.

The Hon. JOHN JOBLING: So that disposes of two interesting options. At what stage are you in relation to portal emissions as a potential long-term operating strategy, bearing in mind DUAP's supplementary condition which seems to have changed the deed of agreement under 78/3, which says the RTA shall further investigate, in conjunction with the EPA, options of a partial ventilation of emissions at the tunnel

portals to achieve energy cost savings as well as a more widespread dispersal of the emissions? Do you support the concept?

Mr BURRELL: We undertook a study during the detailed design phase in response to that supplementary planning approval and it was preliminary and is, I believe, on public record.

The Hon. JOHN JOBLING: A briefing paper called the M5 East Motorway Mainline Tunnel Portal Emission Validation Monitoring Study - and I do apologise for the length of the title - says that in response to supplementary DUAP condition 73/8 Hyder Consulting carried out air quality screening. It is proposed that the conclusions of the original screening assessment will now be implemented and one of the drivers behind the need for resolution of a portal emission issue is also understood to be a concern relating to in-tunnel visibility. What do you mean by "one of the drivers behind the need for resolution of a portal emission issue"?

Mr BURRELL: Firstly, the recommendations from the initial study and the primary recommendation from the initial study were to undertake further detailed assessment in response to that supplementary approvals condition and so that is the recommendation to which you have alluded in terms of the recommendation "will now be implemented". In terms of portal emissions in the context of in-tunnel visibility, I have already commented on that in that memo.

The Hon. JOHN JOBLING: So the conclusion that you draw from it, as I observe from the particular memo, says that the outcome of the additional investigations is to be a robust and thorough assessment that continues, and then we get some interesting bits, the potential for cumulative impacts on potential receptors as a result of portal and on/off ramp emissions; the determination of prevailing air quality, both local, micro and meteorological conditions that could limit the use of portals for emissions due to environmental criteria; determination obviously of vehicle flows, et cetera, but in this case would you not then be affecting four major portal areas, namely the eastbound carriageway, that is the eastern portal, the westbound carriageway, being the western portal, the Princes Highway exit ramp portal and the Marsh Street exit ramp portal? It is a fairly expansive area that would be affected, is it not?

Mr BURRELL: We were responding only to a request to undertake further studies in relation to 73/3, supplementary DUAP condition, and they were the outcomes of the findings.

The Hon. JOHN JOBLING: The conclusion that I would draw from that is that portal emissions at four portals are going to be used, the number of people in the surrounding area will be increased and the problems of the emissions both gaseous and so-called innocuous haze will enlarge its area of affect on people within X number of hundreds of meters of the portals?

Mr BURRELL: Not at all. That study is preliminary only in response to that request under the supplementary conditions and no firm conclusions have been drawn in terms of commencement or otherwise of that.

The Hon. JOHN JOBLING: When you go back to the original question, why would you come to that conclusion? Mr Tucker, are the fans ever turned off?

Mr TUCKER: On occasions due to maintenance, unless there was a system failure.

The Hon. JOHN JOBLING: How many systems failures have you had during the twelve-month operation of the tunnel?

Mr TUCKER: As reporter in our submission there are a number of occasions where they had component failure with the actual fans but at no time did that compromise the operation of the ventilation system because we have excess capacity in the fans, we have a redundancy in additional fans.

The Hon. JOHN JOBLING: In view of the structural arrangement of venting the tunnel, down one tunnel around the corner and back halfway then onto the stack it would seem to me if one fan was out of operation the draw down on the others would be extremely high as would your electricity bill to increase the

volume?

Mr TUCKER: As I said we have spares, if one fan was to go down there is another to take its place.

The Hon. JOHN RYAN: When you say the fans are off does that mean there is a period when the tunnel is not ventilated at all or it would be partially ventilated at all times?

Mr TUCKER: There are occasions where the exhaust fans at Turrella are required to the turned off and we rely on longitudinal ventilation using jet fans to maintain air quality within the tunnel. These activities are carried out at night generally between 9 o'clock in the evening and 5 o'clock in the morning where there is minimum traffic.

The Hon. JOHN JOBLING: I put the question on notice to you: When fumes are required to be released from the portals and in a maintenance period or emergencies, what constitutes maintenance that would require the portals to be used?

Mr TUCKER: When there is a requirement to turn off the exhaust fans at Turrella or for maintenance staff to access air quality equipment within the stack.

CHAIR: Are you prepared to take questions on notice?

Mr GREINER: Indeed.

(The witnesses withdrew)

PAUL JOHN FORWARD, Chief Executive Officer, Roads and Traffic Authority, Centennial Plaza, Elizabeth Street, Surry Hills,

PHILLIP JAMES GALLAGHER, Motorway and Tollway Operations Manager, Roads and Traffic Authority, Flushcombe Road, Blacktown, sworn and examined:

GARRY RAYMOND HUMPHREY, General Manager Motorway Services, Roads and Traffic Authority, Flushcombe Road, Blacktown,

JAY SUZANNE STRICKER, General Manager Environment and Community Police, Roads and Traffic Authority, Centennial Plaza, Elizabeth Street, Surry Hills, affirmed and examined:

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr FORWARD: Yes.

Mr GALLAGHER: I am.

Mr HUMPHREY: Yes.

Ms STRICKER: Yes I am.

CHAIR: If you should at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be seen or heard only by the Committee, the Committee would consider your request but it may be overturned by a vote of the Legislative Council. Would you like to make an opening statement?

Mr FORWARD: I am aware that the Committee has limited time, we have made a submission and I hope that members of the Committee have read that submission. We are happy to answer any questions in regard to that submission.

CHAIR: In this morning's Sydney Morning Herald, there is an article by Joseph Kerr in which the former witness Mr Nick Greiner talked about "mainly safe particles from diesel exhaust." Do any of you agree with that statement?

Mr FORWARD: My opinion and our opinions are not particularly relevant. We are a motorway/roads authority. We provide maintenance, operational activities and we satisfy the standards that are set for us on our motorways. The regulator sets those standards; we are not the regulator. We operate those motorways and the road system in conjunction with, in some of the motorways, the private sector. It is up to us to meet those standards. I do not have a particular view on what Mr Greiner had to say this morning.

CHAIR: Would you know what to be in-tunnel standard would be for particulate matter?

Mr FORWARD: We satisfy the conditions and standards. As far as I am aware there are no standards for in-tunnel particulate matter.

CHAIR: Were you aware of the evidence given this morning that the in-tunnel particulate matter levels reached 2000 micrograms per cubic meter averaging around 800 to 1000 micrograms per cubic meter? The previous witnesses were from Baulderstone Hornibrook.

Mr FORWARD: We were not here this morning. I am not in a position at this particular point in time to answer that; I will take that on notice.

CHAIR: What monitoring is a done of particulate matter within the tunnel?

Mr FORWARD: The conditions state that there is no requirement to monitor particulate matter within

the tunnel, however RTA has taken upon itself to monitor the visibility within the tunnel and we have set the National Road Federation standards, PIARC standards for visibility; and we monitor visibility within the tunnel. Whilst that is not directly measuring PM10 or any of the other particulate matters, it is an indicator of the levels of particulate in the tunnel. As you would be aware most of that particulate matter is caused by diesel emissions and we are way within the PIARC standards.

CHAIR: For visibility, not necessarily for health impacts because that is not a PIARC standard?

Mr FORWARD: That is correct, they are a road safety standard in terms of visibility of motorists within the tunnel so they can see in the tunnel and that traffic flows in the tunnel.

CHAIR: Does RTA have an obligation to provide safe roads?

Mr FORWARD: Yes of course we do.

CHAIR: Would you consider the level of particulate matter within the tunnel is safe for motorists passing through?

Mr FORWARD: We are here to satisfy conditions of approval for the project, which are set by an independent process. We do not sets those standards, those standards are set for us and we are obliged to meet those standards. We meet those standards.

CHAIR: Do any of your employees go in the tunnel?

Mr FORWARD: Our employees regularly in the tunnel.

CHAIR: Do you have an obligation to ensure benzene, formaldehyde and particulate matter within the tunnel do not affect their health?

Mr FORWARD: We have occupational health and safety standards. We take those very seriously.

CHAIR: If you take it seriously do you monitor for class 1 carcinogens like benzene inside the tunnel?

Mr FORWARD: No as I say we satisfy all the occupational, health and safety standards required of us.

CHAIR: What are the occupational health and safety standards for exposure to particulate matter such as benzene and formaldehyde within the tunnel?

Mr FORWARD: I do not have those with me.

CHAIR: Are you aware there are any?

Mr FORWARD: I would have to take that on notice.

CHAIR: Are any of the other witnesses aware there are any? No-one can answer that?

Ms STRICKER: There is some information about WorkCover standards for benzene and some of the other compounds but not particularly within the tunnel environment.

CHAIR: Whilst your employees go in the tunnel you do not know whether it is safe to go in the tunnel because you do not measure for class 1 carcinogens, formaldehyde or particulate matter? They may be going into an unsafe environment and you simply do not know?

Mr FORWARD: As you know we measure for CO and NOx in the tunnel. Our employees are aware of that and are on the whole those standards are met. I can only repeat we are not the regulator, we satisfy the conditions given to us and meet those standards.

CHAIR: I am talking about the duty of care you have towards your own employees?

Mr FORWARD: Sorry, what was the question?

CHAIR: I am asking about the duty of care you have as the CEO of RTA towards the health of employees who go into that tunnel for more than a few minutes and their exposure to class 1 carcinogens and particulate matter, particularly PM2.5, which is predominant, from diesel fumes?

Mr FORWARD: As I say we meet the standards that are laid down to us and we have measures of CO and NOx also measures of visibility. It is a proxy for the particulates. We are not required to measure particulates in the tunnel and we believe our staff is not unduly exposed to the standards you referred to.

CHAIR: If you do not measure you will not know, will you?

Mr FORWARD: Sorry, what is the question?

CHAIR: If you do not measure what is in the tunnel you do not know what people are being exposed to. I am quite surprised you do not measure other than for carbon monoxide and NOx when there are other as dangerous compounds within the tunnel.

Mr FORWARD: We satisfy the OH & S requirements for the tunnel.

The Hon. JOHN RYAN: Mr Forward, I would like to get details with regard to the use of traffic management and lane closures to regulate air quality within the tunnel. Is it a fact there is a procedure for closing down lanes within the tunnel during circumstances when air quality becomes degraded?

Mr FORWARD: No that is not correct. We have well-developed procedures with the operator, Baulderstone Hornibrook/BHEgis. As you would appreciate a road system is a highly complex interdependent network of roads. If there is an accident, incident or breakdown either inside the M5 East tunnel or outside the tunnel that is likely to affect the traffic flow into the tunnel and we would know in fact the chance of the traffic banking back in the tunnel and having to queue and stop within the tunnel is a possibility, then we restrict the traffic flow into the tunnel because of those incidents. That is the prime purpose of regulating traffic flow into the tunnel.

The Hon. JOHN RYAN: How do you go about regulating the amount of traffic that goes into the tunnel during those occasions?

Mr FORWARD: Do you mean the techniques?

The Hon. JOHN RYAN: You seem to be suggesting there are procedures RTA have for preventing or regulating the flow of traffic into the tunnel during times when air is likely or potentially degraded. How is that done?

Mr FORWARD: No I did not say that, I said when there is an incident that interferes with the free-flow of traffic along the M5 East and we do that on lots of our roads in Sydney, not just the M5 East. If there is an incident on the Harbour Bridge, or an incident in the Harbour Tunnel, or an incident on the Pacific Highway, we will redirect traffic into other roads. It is a standard operating procedure that RTA has been doing for a number of years and it works to more effectively move the traffic flow. It is not related to air quality.

The Hon. JOHN RYAN: If you say there is no procedure for regulating the traffic either into or within the tunnel for degraded air quality conditions, why am I looking at a document which was tabled with papers released to Parliament entitled "BHEgis JB Procedure Tunnel Degraded Air Quality", release date 11/4/2001, procedure A(1): Detect and verification with CO or visibility monitors and alarms. Alarms will be generated when speeds drop to 60, 40 and 20 kilometres an hour. A(2): Record the nature of the incident,

notification, alarm and so on. Then it goes to procedure D(1): Initiate a stage in which the speed limits in this case apply to open section prior to entry portal, which seems to suggest that the speed limits are changed within the tunnel during those circumstances. Then there is procedure F(1): Commence stage 2 traffic management response in consultation with RTA TMC. As I understand, that procedure is closing the on ramp. Then it goes on to say: Monitor air quality to check if stage 2 returns air quality to acceptable levels or if it degrades further. This procedure goes on to basically outline, with a flow chart, the closure of lanes and the regulation of traffic within the tunnel. What is the purpose of this document if it is not to respond to air quality monitoring within the tunnel?

Mr FORWARD: Can I ask for a copy of the document?

(Document tabled)

Mr FORWARD: This is not an RTA document, this is a Baulderstone Hornibrook Egis document for their procedures. It does relate to the traffic flow incidents that I spoke about earlier. Clearly, if there is an incident outside the tunnel that affects the traffic flow in the tunnel and if vehicles are allowed to go into the tunnel and to not move, to actually be forced to stop within the tunnel, then there is a potential air quality issue associated with the stopped vehicles in the tunnel. That is the reason, but it has nothing to do with air quality per se, it is all to do with traffic flow and the by-product effects that would happen if in fact traffic was unable to move in the tunnel.

The Hon. JOHN RYAN: I will read to you from another document entitled "M5 East Guidelines for Moveable Barrier Operation". This document, and I can hand it to you in a moment, says--

The Hon. JAN BURNSWOODS: Can I ask where the document came from?

The Hon. JOHN RYAN: It was tabled when papers were tabled in Parliament.

The Hon. JAN BURNSWOODS: What is the date of the document and the source?

The Hon. JOHN RYAN: The source of the document is the papers upstairs, I cannot tell you the source of the document.

The Hon. JAN BURNSWOODS: Who wrote it?

The Hon. JOHN RYAN: Well, I will table it in a moment. I am asking questions.

The Hon. JAN BURNSWOODS: It would be nice if the Committee knew.

CHAIR: Order.

The Hon. JAN BURNSWOODS: Surely we have a right to know--

The Hon. JOHN RYAN: You will, and I will hand you a copy of the document in a moment.

> Unplanned Closure - Urgent: For use only when an urgent closure of the barrier is required, e.g. procedure PRIMP007 Tunnel Degraded Air Quality.

What is procedure PRIMP007 Tunnel Degraded Air Quality if it is not a procedure for regulating the air quality within the tunnel by regulating the flow of the traffic? It goes on to describe how the barrier is controlled. There is a barrier operator, I understand, who comes down and basically closes off the tunnel when there is a concern about air quality. Another document appears to say the same thing. Is that an RTA document?

Mr FORWARD: Could I see the document? There is nothing on this to indicate that it is an RTA document. This is a BHEgis document. That is their logo on the top. It is not an RTA document. Once again, I

can only repeat - and I would have hoped you would have asked BHEgis this this morning - that the reason for regulating the traffic in the tunnel is to respond to an incident that might cause traffic to build up in the tunnel and to even come to a standstill within the tunnel. We want traffic to be able to flow through the tunnel, not to be stood at a standstill in the tunnel. The whole idea of regulating the tunnel is to minimise any of those impacts.

The Hon. JOHN RYAN: But you are regulating traffic not just to make it flow through, you are regulating the traffic in order to prevent CO concentration, are you not?

Mr FORWARD: The primary purpose of incident management is to allow the traffic to avoid the incident, to by-pass the incident or to be able to move on to other road corridors.

The Hon. JOHN RYAN: To regulate air quality within the tunnel, though. Is that not one of the issues that would be of concern?

Mr FORWARD: Mr Ryan, if this was on the Pacific Highway and we had a major traffic incident at Turramurra or at Chatswood, we would redirect traffic around that incident. It is all to do with traffic flow. The issue there, of course, is if the traffic was in the tunnel, once you are in the tunnel you cannot divert into side streets, you are stuck in the tunnel. The idea is to not allow traffic to be stuck in the tunnel, to divert the traffic around the tunnel so that that does not happen.

The Hon. JOHN RYAN: There is a minute of an air quality and community liaison group meeting relating to the M5 East freeway at which there were representatives from the RTA present, including Mr Phil Gallagher, Mr Peter Morris and Jay Stricker. At that meeting the individuals from the RTA were asked a variety of questions relating to this very issue. I might need to read you a couple of pieces from the meeting, but it says: An RTA person was explaining if 80 parts per million for five minutes is recorded then the operator would introduce stage 2 traffic management. For the eastbound carriageway one lane would be closed using lane usage signals, traffic merges, and if this causes traffic to slow for the westbound carriageway stage 2 management involves closing the Marsh Street on ramp using boom gates and one lane on the mainline using lane usage signals for metering the traffic. If air quality degrades further, 87 parts per million for five minutes was detected, then the appropriate tube would be closed. This is stage 3 traffic management. In September there were no stage 3 management incidents. To date in October, apart from a fire incident on 8 October, there was a bus breakdown which caused a tube closure for about ten minutes. In this case the readings did exceed 87 parts per million for an average more than five minutes on one particular monitor. The CO did not exceed 87 parts per million for 15 minutes. That, sir, is a person from the RTA explaining something called stage 2 traffic management. That is not Baulderstone Hornibrook, it is your own people.

Mr FORWARD: Mr Ryan, that document is one of many documents and can I suggest that you are taking it out of context. The whole purpose of that document is as a part of the procedure for traffic management. It is consistent with my earlier answer on this issue.

The Hon. JOHN RYAN: Well, I put it to you that there is a complete contradiction. This appears to be a person from the RTA explaining to a community meeting that there are what are called stage 2 and stage 3 traffic management responses which specifically respond to measures of parts per million with regard to carbon monoxide in the tunnel and on a couple of occasions a person from the RTA has described one tube being closed accordingly. I do not see how that could mean anything else. If it does, I would be grateful if you would explain it to me. Ms Stricker was present at the meeting, as was Mr Gallagher. Perhaps they might have something to add which explains how simple English words, which appear to describe a procedure for closing the tunnel when the air quality becomes too degraded, mean something other than they mean to me, or are the minutes inaccurate?

Mr FORWARD: No, you have taken one document out of context. That document relates to procedures when there is a traffic incident. Now it is all very well to quote part of that document, but the whole procedure is there for traffic incident management.

The Hon. JOHN RYAN: Mr Forward, could I inform you that I am a regular user of the tunnel and I

cannot tell you how many times I have been through that tunnel, particularly in the evening, when there is an announcement of an incident on the monitor. I drive through the tunnel at 40 kilometres per hour for the entire length of the tunnel. There is not a single RTA person working in the tunnel. All that has happened is that there are red lights on the left lane which close it down. I go through and nothing has happened. In view of the community giving evidence such as I have just described and experiences which I understand are quite common, you can understand why the community believes that there is a procedure for closing or regulating the use of the tunnel to respond to air quality incidents. You can rule me out if you wish, but it does appear that there is a raft of evidence, and I am not going to bore the Committee further by reading what appear to be lengthy documents that do seem to indicate that such a device is in operation, that it is in operation because the RTA requested Baulderstone Hornibrook to have some procedure for controlling CO limits within the tunnel, which to me makes sense. Obviously there might be incidents such as you have described, such as a bus breakdown, which would require them to respond. It seems to me to make sense. Is there a procedure or not?

The Hon. JAN BURNSWOODS: At which point the witness should probably say: The speech was so long I have forgotten the question.

The Hon. JOHN RYAN: Could I have a point of order and just simply ask the member to remember her manners.

The Hon. JAN BURNSWOODS: You managed to arrive here one minute before Nick Greiner left because you are a gutless wonder and now you are asking a whole lot of questions--

CHAIR: I ask the member to withdraw that comment.

The Hon. JAN BURNSWOODS: I withdraw it, of course.

The Hon. JOHN JOBLING: Just to set the record straight, this needs to be said: The honourable John Ryan rang me at about 8.40 and told me that he had been on the M5 since 7 o'clock, he was still on the other side of Liverpool in a traffic jam and would do his best to get here as close to 9 o'clock as possible. I think that needs to be put on the record. That is the reason he was late.

The Hon. JAN BURNSWOODS: The other thing that needs to be put on the record is that his apologies were not given to the Committee.

Mr FORWARD: Mr Ryan, we have not given any direction to Baulderstone Hornibrook Egis to close the tunnel to manage air quality. We have asked them to manage the traffic flow in the tunnel in order to address any incident that will occur either in the tunnel, outside the tunnel or in the surrounding road network whereby the traffic flow in the tunnel will affect that incident. I cannot be any clearer in response to you.

The Hon. JOHN RYAN: Well, we will give you copies of the documents and you might explain to us in detail the context or the manner in which those documents have been taken out of context because I say, with great respect, Mr Forward, that there does appear to be a phenomenal contradiction in the evidence.

Mr FORWARD: Well, presumably, Mr Ryan, you had the opportunity to ask Mr Greiner and the people from Baulderstone Hornibrook about that this morning.

The Hon. JOHN RYAN: Well, I will not go through why I did not, but I do not think it is just a matter of me asking Mr Greiner.

Mr FORWARD: Well, they are the operators of the tunnel.

The Hon. JOHN RYAN: You are the public servant, sir; I think you need to know about this.

Mr FORWARD: Well, I do need to know and I have given you the answer, with respect.

The Hon. JOHN RYAN: I would be grateful if you would not lecture me about what I am supposed to

know and not supposed to know.

The Hon. PETER PRIMROSE: Maybe it is that tunnel air getting to you.

The Hon. JOHN RYAN: Some people are more juvenile than I had imagined. Can I ask you about the cost of electricity to run the ventilation fans? I refer to a document here by F T Doyle, the project director I think for Baulderstone Hornibrook, referring to a request I think made by the RTA for three additional operational conditions for the Turrella ventilation stack: "Our cost estimates are as follows", and it gives them and it refers to the installation of baffles, running fans 24 hours a day and additional stack height. Could you give the Committee some indication of what those additional requirements result in in terms of cost in the running of the tunnel? The reason I ask the question is that there are some members of the community that believe that the costs of running the tunnel far exceed the cost of installing electrostatic precipitators.

Mr FORWARD: There are two issues here one is there are contractual arrangements between RTA and Baulderstone Hornibrook for the maintenance and operation of the entire M5 East project, which as you would appreciate not only includes the tunnel but also the motorway that feeds inside the tunnel and outside the tunnel. That is a contractual requirement for operation and maintenance of that part of the motorway networks for a period of ten years. That is on the public record. There is a fixed price that we are charged for that work. In addition to that as part of the negotiations with RAPS before the tunnel was to open there was an agreement to run the fans at a high velocity. As I said there is a fixed price on that and there is the variable amount we entered into to change some of those conditions.

The Hon. JOHN RYAN: Perhaps you might provide more detail to the Committee on notice? I have in front of me what appears to be a tender document, tabled pursuant to the order of Parliament, showing that RTA surveyed a number of companies and asked for operating specification of their electrostatic precipitators. The company CTA appears to have responded that they have a facility that would remove particles within a range of 0.3 and 10 micrograms in mass to an efficiency rate of 90 percent. Am I correctly interpreting that suggests this equipment has that capacity?

Mr FORWARD: Would you show me the document? As part of the conditions of approval RTA is required on an annual basis to survey the world in terms of developments with regard to technology that might affect the operations of the tunnel. We have commissioned most recently Connell Wagner to do that work for us. I understand this is a draft of part of their report on that matter. We have not asked for companies to put in a tender because the Government has a very strict policy with regard to asking companies to go through the cost of submitting tenders if in fact they are not going to accept a tender at the end of that process. Here we have a request from Connell Wagner to a variety of companies who provide this equipment for their understanding of the standards that can be met.

These are manufacturer's claims with regard to standards they believe their equipment can meet. We have worked closely with a number of other road authorities on this particular matter, one being the Norwegian Road Authority. To my understanding the company you referred to is a Norwegian company who have installed this equipment in some tunnels in Norway. We have asked the Norwegian Road Authority for evidence that these particular outcomes can be delivered the advice we have from the Norwegian Road Authority is that they are unable to provide us with that documentation. They have no scientifically based evidence that those standards can be met, apart from the manufacturer's claims that are contained in this document.

The Hon. JOHN RYAN: The claim of the manufacturer appears to suggest 90 percent of the particulate matter down to a very small level could be removed. That is a fact is it not?

Mr FORWARD: That is the claims of the manufacturers. Whether they achieve those standards or not we have been unable to obtain any scientifically backed evidence that that is in fact the case.

The Hon. JOHN RYAN: From one source only, the Norwegian Road Authority?

Mr FORWARD: No we have asked the consultant Connell Wagner to survey the world to try and find

evidence that scientifically based studies have been carried out that show that those outcomes have been delivered. To date we have not been able to get access to any scientifically based document. In fact at a conference at an International Road Federation Conference about a year ago, a paper was delivered by an engineer from one of the Norwegian universities, along with a member of the Norwegian Road Authority that actually verified that particular point.

The Hon. JOHN RYAN: EPA has told us measurements have been taken for PM2.5 at monitoring station U1, is this correct? If so, why was this material not made available in response to Parliament's call for papers?

Ms STRICKER: I am not aware that RTA actually has the data from PM2.5 monitoring at U1. I would have to take that on notice.

The Hon. JOHN RYAN: Who would be likely to have that?

Ms STRICKER: The company that does the monitoring, it is not done directly by RTA.

The Hon. JOHN RYAN: I have seen reference to a project deed between Baulderstone Hornibrook, the joint venture and RTA. Could you explain how this project deed operates, its terms and conditions? Of particular interest to the Committee might also be, in the event of a decision being made by Government or a regulator to require the installation of electrostatic precipitators, who would meet the cost?

Mr FORWARD: The project deed is the main contractual document between RTA and the contractor. The project deed would in fact cover a number of issues, one would be, firstly, the building of the tunnel and the building of the motorway that feeds into the tunnel and that has to be built in accordance with standards within the project deed. Associated with that is the operation of the tunnel, operation of the motorway and maintenance of the motorway for a period of ten years from the date of opening. That is also covered by the project deed. That is what the project deed is there to do. The conditions that have been given to us by the Minister for Urban Affairs and Planning, as a contractual arrangement between Baulderstone Hornibrook and us, have to be met within the project deed. If there are any additional requirements placed on the RTA after the project deed was signed off then they are matters that RTA would have to fund.

The Hon. JOHN RYAN: Does RTA have plans to use portal emissions as a means of controlling the visibility haze that appears within the tunnel in the foreseeable future? I know there was reference to a long-term use of portal emissions in the planning conditions set by Planning NSW. Is there any on-going discussion or study that suggests the use of portal emissions as a means of controlling air quality within the tunnel particularly as it relates to visibility?

Mr FORWARD: They are conditions the responsibility of Planning NSW not RTA. We are not the regulator of any of those matters. That is a matter of Planning NSW to look at.

The Hon. JOHN RYAN: I do not imagine something like this could happen without RTA knowing about it. Is RTA aware of any procedures to study, trial or in anyway use portal emissions as a means of controlling the visibility problem within the tunnel?

Mr FORWARD: No.

CHAIR: I have a letter sent to Paul Forward from Sam Haddad, Executive Director, Planning NSW dated 12 September last which in part 11 states:

> As advised by way of letter 19 June 2002 effective traffic management devices should be implemented including ramp metering, closure and/or tunnel closure devices, traffic signals including support by visible barriers at the tunnel entrances and incorporation into the overall traffic management system. Where possible this should also enable tunnel usage to be diverted to other routes well before the entrance. The general goal should be to ensure to the greatest extent practicable that no individuals are in the tunnel for longer than fifteen minutes consistent with the air quality goals specified in condition 70.

Does that not mean Planning NSW is asking you to close where the levels are too high?

Mr FORWARD: This is exactly the same issue I was talking to John Ryan about earlier; it is all focusing on incident management.

CHAIR: Management to accord with condition 70, air quality goals?

Mr FORWARD: Yes but that letter relates to incident management in the tunnel and the associated road network.

CHAIR: They are talking about exposing motorists to levels for longer than fifteen minutes. That is how the letter starts. The whole letter is about in-tunnel air quality. I am sure you are aware of letter?

Mr FORWARD: Yes.

CHAIR: It does not talk about incidents; it is "in tunnel air quality".

Mr FORWARD: It relates to incidents. It is saying if there is an incident in the tunnel or just outside the tunnel and we allow motorists to freely flow into the tunnel they would be stuck in the tunnel potentially for fifteen minutes. That is the risk Mr Haddad is trying to avoid and therefore he is talking about ramp metering, all those incident management systems RTA employs to ensure we get as free flow as possible of traffic when there is an incident.

CHAIR: Is a traffic jam an incident?

Mr FORWARD: It is a matter of what causes the traffic jam.

CHAIR: If there is a traffic jam the other side of the tunnel that causes a traffic jam in the tunnel, is that an incident?

Mr FORWARD: Yes it would be.

CHAIR: Therefore you would implement conditions recommended by Planning NSW to close various ramps and so on so people would not be exposed for more than fifteen minutes?

Mr FORWARD: Let us take an example; if there was an accident on General Holmes Drive, which there has been, what would you expect to happen? You would expect traffic would queue through the M5 East tunnel. If that incident was blocking traffic there is clearly nowhere traffic can get too. It would cause a dam effect on the traffic; the traffic would queue back into the tunnel. We are trying to divert motorists away from the tunnel so they are not stuck in the tunnel during those incidents.

The Hon. MALCOLM JONES: Within twelve months the tunnel is performing at capacity at peak times. How long will it be before we would deem the demands are overloading that tunnel? It is only a four lane tunnel and already we are reaching performance capacity. How long before we have regular ramp monitoring or diversions into the tunnel at peak periods?

Mr FORWARD: The capacity of the tunnel is regulated by the capacity of the road network around the tunnel to accommodate that amount of traffic. It is true the network the tunnel is part of during the peak periods is fundamentally close to capacity. The Government has a strong position here and it has stated on frequent occasions you cannot build your way out of congestion. What tends to happen is that we are managing the network more efficiently using technology and better traffic management devices. To give you an illustration, there are seven main arterial roads that come into Sydney. Even though over the last ten years there has been a forty percent increase in traffic volume the average speeds in the am and pm peak are fairly constant over that time period, if anything those average speeds are marginally higher over the last year. That is the evidence we have before us. It demonstrates RTA is managing that traffic but it is true to say during the peaks our road system is congested.

The Hon. MALCOLM JONES: During that ten years a lot of major roads have been opened to accommodate that traffic?

Mr FORWARD: The major roads are really at the margin when you look at the whole network around Sydney. If you take the major corridors, Pacific Highway, Victoria Roads, M4, et cetera, there have been marginal improvements to the number of lanes in those areas. A lot of it has been through our sophisticated SCATS traffic management system a computerised system that operates traffic lights; we put right-turn-bays in, we have put in a variety of measures to manage the flow of traffic. What happens is that the shoulders of the peak expand out. We are finding on the M5 East, for example, freight companies are often directing freight movements when they know they will get the best traffic conditions on that motorway.

The Hon. MALCOLM JONES: Have you built a tunnel that is too small for the future?

Mr FORWARD: No we have built the tunnel that fits into the network that it feeds into. You cannot look at a tunnel in isolation; you have to look at the entire network.

The Hon. MALCOLM JONES: It is relatively inexpensive to expand the capacity of a road whereas it is extremely expensive to expand the capacity of a tunnel. If the tunnel is built to suit today's requirements how will it manage tomorrow's requirements?

Mr FORWARD: It is not just the tunnel, if we were to build a bigger capacity in the tunnel you have to build more capacity in the network; the viaducts that go across the Botany wetlands are restricted to two lanes. The whole length of General Holmes Drive is fed from two lanes from the tunnel and three lanes from General Holmes Drive from Brighton-le-Sands. It is the whole network you have to look at; you cannot just look at the tunnel in isolation. If we were to add more lanes in the tunnel we would have to add more lanes to the rest of the network.

The Hon. MALCOLM JONES: My point is could those extra lanes not have been built into the tunnel in anticipation of growth in traffic volume, because to expand the tunnel is infinitely more expensive than to expand a lot of the roads--

Mr FORWARD: In that particular case, the main issue of restriction in fact is the airport tunnel. With traffic in the morning peak you have two lanes from the M5 East and you have three lanes coming in on General Holmes Drive from Brighton. They feed into four lanes in each direction through the airport tunnel. The airport tunnel cannot be expanded without closing the airport. That is the major constriction point. What we do there is actually tidal flow one of those lanes, so we have five lanes going to the city in the morning and three lanes going in the other direction. That is the major restriction point on that part of the network, so even if we did build more lanes on the M5 East they could not get past the airport tunnel configuration.

The Hon. MALCOLM JONES: Therefore, problem A, being the airport tunnel, would determine the future capacity of the M5 East tunnel, or a number of these isolated locations would determine how big you would build the tunnel?

Mr FORWARD: Well, as I say, you have to look at the whole network and how a piece of infrastructure would be integrated into the operation of the network.

The Hon. MALCOLM JONES: Is it fair to assume that in the future the number of vehicles, the overall capacity of the passenger fleet and trucks, will expand?

Mr FORWARD: Well, certainly the volume of trucks will expand into the future and what tends to happen is that the peak period spreads out.

The Hon. MALCOLM JONES: Will the network have to expand in the future to accept this increment in traffic?

Mr FORWARD: In fact that has been happening since the start of the century, the network has been

expanding, but in terms of that particular corridor we would be strong arguers to say that the rail network support in fact should be expanded.

The Hon. MALCOLM JONES: That is another issue. Going back to this ever-expanding volume of traffic, is it not reasonable to expect that there would be some capacity or greater capacity in the M5 East tunnel to handle greater capacities in the future, because we are already peaking out now after a year.

Mr FORWARD: Well, a lot of our roads in Sydney are at peak during the peak period. During the off-peak period they are under capacity and we are finding that more and more trucks that access the port and Sydney airport are making a decision to use that part of the network during the off-peak period.

The Hon. MALCOLM JONES: You keep diverting to other things.

Mr FORWARD: No, can I just say you cannot continue to build yourself out of congestion. There is a limit to how much road space you can provide in Sydney and you just cannot provide more and more lanes without providing more and more lanes elsewhere, so you just keep going on and building more and more and more. You have to manage the traffic as best you can in the current environment and, as I say, the evidence suggests that over the last 10 years we have had a 40 percent growth in traffic volume. The average speeds have remained fairly constant. If anything, in fact, they have improved slightly.

The Hon. MALCOLM JONES: But that has been achieved by building more and bigger roads.

Mr FORWARD: No, I do not agree with that. It has been achieved by better management. If you look at the better roads we have built over the last 10 years, it is a small proportion, a tiny proportion, to the total network that is actually there.

The Hon. MALCOLM JONES: You have unburdened lots of roads which were previously congested.

Mr FORWARD: No, not true. The RTA in terms of State roads has--

The Hon. MALCOLM JONES: The M5 East is an example of that.

Mr FORWARD: We have 18,000 kilometres of roads in New South Wales. If you look over the last 10 years, as to how many additional kilometres we have added to that, it is not a lot. It is at the margin.

The Hon. MALCOLM JONES: But New South Wales is not congested, Sydney is.

Mr FORWARD: Well, we can look at the number of roads in Sydney as well and it is the same thing. Yes, the M5 East has helped. It has carried 25 million vehicles since it has been opened and that is a lot of vehicles off the surrounding road network. I would agree with you that there has been a tremendous increase in improvements in that area, but there is a limit on how much extra road space you can build.

The Hon. JOHN JOBLING: Just to assist me to get it right, as I understood in your brief opening comments, or perhaps the answer to the first question, you made it, I thought, very clear that the RTA's role is to move traffic, it is all about traffic flow, and this one could fairly describe as your role and principal activity. Is that a fair assumption, in general terms?

Mr FORWARD: Well, with due respect, it is broader than that. We have certain requirements that the Government expects of us as an organisation. They are spelt out in our corporate plan. It is not just a simple matter of moving traffic, although yes, I would admit that that is one of the roles of the RTA. Can I go on to add that in each of these projects we have certain conditions of approval and we must reach those conditions of approval.

The Hon. JOHN JOBLING: I would hope, and I would guess everybody would hope, that that is so. A question I asked of a previous witness I would like again to clarify to make sure that the answer is the same: If electrostatic precipitators were resolved, by whatever means, to be installed in the M5 East tunnel, who

would be responsible for the cost of the installation? Would it be the RTA, the operator or whom?

Mr FORWARD: If, as a matter of Government policy - and this is a hypothetical--

The Hon. JOHN JOBLING: I accept it is, but it needs to be clarified in my own mind because of an answer I received.

Mr FORWARD: If the Government decided to change the conditions of approval, it would be the RTA that would be responsible to fund whatever expenditure was required.

The Hon. JOHN JOBLING: So I would not be expecting to see the tolls go up then, I hope.

Mr FORWARD: Well, there are no tolls on the M5 East.

The Hon. JOHN JOBLING: No, but there might be if that happened.

Mr FORWARD: Well, Government policy is not to have tolls on the M5 East.

The Hon. JOHN JOBLING: Can I look at DUAP's condition 70, which particularly details, as I understand it, the EPA requirements for in-tunnel air quality reporting. I also refer to an advising that you had of 19 April this year from Clayton Utz which relates to this statement in a memo:

> I think we should also consider the practical view that issuing formal advice to EPA on how the RTA wants to report the data may provide the EPA with an opportunity to dictate to us additional and more onerous requirements.

The letter comes from an officer of the RTA Motorway Services Branch. What did the Clayton Utz advising say and why is there a concern that that may allow the EPA an opportunity to dictate to the RTA more onerous requirements? What does that mean?

Mr FORWARD: Mr Chairman, I would like to claim legal privilege here.

The Hon. JOHN JOBLING: Are you saying that this Committee cannot understand or be told why RTA is worried about advice from EPA?

Mr FORWARD: No. Mr Chair, I would like to claim legal privilege on this matter.

CHAIR: Accepted.

The Hon. JOHN JOBLING: Can the RTA supply to the Committee, whether in confidence or not, advice they have received in relation to EPA that concerns them specifically in relation to DUAP and condition 70?

Mr FORWARD: I will take that on notice Mr Chair.

The Hon. JOHN JOBLING: Mr Forward, are you aware of PM2.5 and smaller particulate matter?

Mr FORWARD: Am I aware of it?

The Hon. JOHN JOBLING: Do you know about particulate matter, in particular PM2.5?

Mr FORWARD: Yes.

The Hon. JOHN JOBLING: Are you aware of the medical argument with 2.5 or less the health affects have been observed for all sized fractions of PM2.5 or less but these known to penetrated deeper into the lungs than PM10 down to 2.5 and pertain preferentially to the larger sized fractions? Are you familiar with that?

Mr FORWARD: We are a roads authority that is required to meet standards set for us by the Minister for Planning. We meet these standards and that advice is no doubt part of the advice he would need to consider when he gives us those conditions.

The Hon. JOHN JOBLING: If you take all considerations into account you would be aware one must be careful of these things?

Mr FORWARD: We are there as a road authority to meet the standards given to us; we meet those standards.

The Hon. JOHN JOBLING: If we look at the National Environment Protection Standard, NEPM, the ambient air quality measure, are you aware of the potential introduction of a standard for particulates such as PM2.5 for the first time, which may come in either this month or next month?

Mr FORWARD: That is a Government policy issue so it is up to the Government to make that decision. I understand NEPM standards are national standards and that would require a national approach to this issue.

The Hon. JOHN JOBLING: At this stage you are obviously testing the air quality in the tunnels that is worrying people. What have you planned or prepared to upgrade your quality testing of the air in the tunnels?

Mr FORWARD: I have already made this point. We meet the standards; until the Government gives us a direction that those standards have changed. We have done nothing to meet any hypothetical standard that may or may not be imposed in the future.

The Hon. JOHN JOBLING: I take you back to the Parliamentary inquiry of May 2001 when you appeared before this Committee and were questioned about the air in the tunnels by The Hon. Peter Breen and your response was:

> I have no doubt whatsoever that the air in the M5 East tunnel will be breathable.

Are you still of that the opinion?

Mr FORWARD: Yes; we have had twenty-five million vehicles go through it since it has been opened so yes I do agree with that.

The Hon. JOHN JOBLING: Have you put up any warning signs at the entrance to the tunnels or the on-ramps suggesting motorists wind their windows up or turn of their outside air-conditioning?

Mr FORWARD: As I say we meet the standards in the tunnel that is a decision for the motorist.

The Hon. JOHN JOBLING: No that is a very simple question, have you put up signs?

Mr FORWARD: No we have not, no.

The Hon. JOHN JOBLING: I have a document from that the Public Protection Environmental Health Branch dated 25 February 2002 that states:

> Discussions with the EPA have highlighted a number of concerns of both health and EPA related to issues related to in-tunnel air quality and it is proposed these issues will be raised with the RTA at the meeting tentatively scheduled for 28/2/02. RTA advice that motorists close their windows and air vents while in the tunnel is reasonable.

Obviously in those days you were expressing some reason for motorists to wind up their windows and turn of the air-conditioning air vents while in the tunnel.

Mr FORWARD: Can I ask what the question is?

The Hon. JOHN JOBLING: I am trying to find out why you have the not put up warning signs when you expressed a view that the RTA advice to motorists to close their windows and air vents while in the tunnel is reasonable? Health agrees with you; I'm wondering why it has not happened?

Mr FORWARD: As I say, the standards are met in the tunnel. We have not provided particular advice to motorists, that is their decision as they go through the tunnel.

The Hon. JOHN JOBLING: It might be fair to allow you to go back and look at discussions of the meeting you had on 28 February 2002 with health about that matter, and you might like to come back to us as to what happened at that meeting and why you have changed your mind? When you were referring to ventilation in tunnels -- and I presume electrostatic precipitators in the Norwegian tunnels -- other than one visit by Garry Humphrey to Tokyo to look at Tokyo WanaquaLine, a tunnel that goes under Tokyo Bay, and I understand he was not very impressed, has anybody visited the Tenozoan Tunnel or any of the number of filtered Japanese tunnels which are perhaps comparable to the M5 East? Obviously the Tokyo Bay one has very low traffic flows.

Mr FORWARD: Can I make a comment about the Tokyo tunnels? This might be an issue you might want to refer to Planning NSW. When planning was investigating the M5 East they sent one of their senior executives on a study visit to a number of road tunnels. I am aware that he did visit Tokyo and Japan; I am not aware of what particular tunnels he witnessed and looked at. I know he talked to a number of Japanese road authority people about the operations of their tunnels and did obtain some information on the operation of those tunnels. Our Connell Wagner report, the tunnel best practice report we are required to do each year, also investigates what is happening overseas and Japan is one of the countries we look at and have continued to look at that since the M5 East was originally reviewed.

The Hon. JOHN JOBLING: I understand Mr Humphrey was only there for one day and then going onto PR Committee meetings in Spain and other places. Would you give this Committee an undertaking that you will review your records and see what other tunnels in Japan you have undertaken and come back to us? It seems of all the tunnels to have been chosen that is perhaps the most unlikely one to have been of use to us.

Mr FORWARD: We are more than happy to do that. The brief that Connell Wagner has is not restricted to one or two tunnels; it is more wide ranging to see what is happening in those tunnels.

CHAIR: Have you any information as to how many of the long tunnels in Japan are filtered?

Mr FORWARD: I am sure we have a report on that, I am sure it is part of the Connell Wagner work that they need to look at that.

CHAIR: You do not have any information?

Mr FORWARD: Not with me at the moment.

CHAIR: Do any of your colleagues have any information?

Mr HUMPHREY: I do not have details at the moment either, sorry.

CHAIR: We have heard evidence that of the sixty long tunnels, forty-one are filtered. We know that; I thought the RTA at least would have known that?

Mr FORWARD: There are many reasons why they might filter those tunnels. The evidence that we have been provided by a number of those countries is that you have to look at local conditions. We are more than happy to review that information.

CHAIR: The fact they filter 68 percent of their long tunnels would be just to do with local conditions?

Mr FORWARD: They have many tunnels in Japan.

CHAIR: I am talking about the sixty long tunnels not the short ones.

Mr FORWARD: Let us look at the data and information and get back to you rather than debate it here when we clearly have not got the most recent information you are talking about. I would like to look at what they classify as a long tunnel and what sort of systems they have a put in to those tunnels.

CHAIR: I thought you would have come here today fully armed with information about what is going on around the world yet you only seem to know about the Norwegian tunnels not the forty-one Japanese tunnels, why is that so?

Mr FORWARD: We will take that on notice.

CHAIR: We do not have much time for notice, when will you get an answer to us?

Mr FORWARD: Let us see how much work as to be done, we will contact Connell Wagner and find out what work they have done recently on this matter.

CHAIR: Will you ask them whether they have visited or at least studied those forty-one tunnels, at least out of sixty, and the reason why each of those forty-one tunnels is filtered?

Mr FORWARD: Can I ask you to give us a list of those tunnels?

CHAIR: Perhaps the RTA should give you, the head of the RTA, a list of the tunnels built when you are advising the Minister as to which tunnels are filtered and why they are filtered. I think it is quite disgraceful you come to this Committee hearing without that knowledge.

Mr FORWARD: I am not sure what tunnels you refer to. You class them as long tunnels, I am unaware of the definition you have of what is a long tunnel. I am trying to be helpful. If you were able to provide me with that information we can ask Connell Wagner to look at those particular tunnels.

The Hon. JOHN JOBLING: Bearing in mind the last time I put questions to Mr Forward dealing with portal emissions and the probability of them happening and you indicated under the existing arrangement portal emissions were very rarely likely to happen. Do you remember discussing that?

Mr FORWARD: I remember the conversation, yes.

The Hon. JOHN JOBLING: With condition 71 expressly prohibiting portal emissions “as far as practical" it was put to us earlier a deal of work has been undertaken with a view to portal emissions and the four portals, which are the basic on-ramps of the tunnel, to assist in clarification of the air quality in the tunnel. Obviously that is a question that can be dealt with for particulate emission. Have you undertaken any work in portal emissions or invited anybody else to undertake such work?

Mr FORWARD: We have negotiated an agreement with Planning NSW when there is an incident in the tunnel that portal emissions can be allowed whilst that incident is occurring.

The Hon. JOHN JOBLING: Is this an extension from the variation of 73/8, which is apparently a new condition of approval in relation to emissions from portals?

Mr FORWARD: It is a variation to one of the conditions that has been negotiated and agreed to buy Planning NSW.

The Hon. JOHN JOBLING: How often would you instruct the operator to emit gaseous emissions from the portals and what work has been done around the four portal areas where residents are living to

determine the health effect and the emission effect on them?

Mr FORWARD: We do not instruct the operator. The operator is aware of that condition. We measure CO and NOx levels outside the portals and when there is an incident and portal emissions are allowed the evidence is that there is a very insignificant change in the levels outside of the portals.

The Hon. JOHN JOBLING: How do you know that?

Mr FORWARD: As I said, we measure CO and NOx outside the portals.

The Hon. JOHN JOBLING: Only outside the portals. What happens within 100 to 150 metres, depending on the wind flow? Have you any idea where the gaseous emissions are going?

Mr FORWARD: Well, they are placed in a position to best record the levels outside the portals.

The Hon. JOHN JOBLING: Outside the portals you have a monitor. Outside that monitor station you in fact have no idea.

Mr FORWARD: Well, the best scientific advice that we have been given is to put the monitoring stations in the particular locations, and they are telling us, on the advice that I have received, that is the best spot to put them.

The Hon. JOHN JOBLING: If the residents at the four portals were to ask you for further monitoring stations, may I take it that you would be happy to assist them?

Mr FORWARD: Well, we would consider that.

The Hon. JOHN RYAN: Are you saying to the Committee that the RTA is not considering or studying portal emissions as a means of normal operations of the tunnel?

Mr FORWARD: As I said, as part of the arrangement with DUAP, during an incident, portal emissions are allowed for that short period.

The Hon. JOHN RYAN: What about during the normal operations of the tunnel?

Mr FORWARD: As I said before, that is not up to the RTA to decide.

The Hon. JOHN RYAN: Are you working towards having that standard changed?

Mr FORWARD: That is not up to us, that is up to the Department of Planning.

The Hon. JOHN RYAN: What is this paperwork that I have in front of me, which I am happy to show you, which appears to be a draft of a study relating to the use of portals, and I quote Mr Gallagher's words: "The draft needs careful rewording to clarify that our first objective is to verify that existing partial and full portal emissions have no adverse impact on nearby receptors and only then can we consider further use of portal emissions as part of normal tunnel operations. If there is to be any proposed change to condition 71, it will require full community consultation and at least an REF". Attached to that is a series of papers that relate to a study of portal emissions. All over that paper is what appears to be the handwriting of Mr Gallagher suggesting various changes, so I think from that we can get a rough idea of what the views of the RTA are. Are you trying to say that either this paper now has no status or that there is no study for the use of portal emissions for the normal operation of the tunnel? If you need a copy of the paper, I am happy to hand you a copy, but it is the only one I have, so I would need to copy it later.

Mr FORWARD: It is not up to Mr Gallagher or the RTA to determine whether there are portal emissions. It is a condition that would have to be considered by the Department of Planning.

The Hon. JOHN RYAN: Have you instructed Mr Gallagher not to do any more work on that?

Mr FORWARD: This is a very sophisticated tunnel, it is a new tunnel and it is a very complex tunnel. We need to understand how the tunnel operates and we are doing a variety of work to better understand how the tunnel works, how the airflow works through the tunnel. That is part of that work.

The Hon. JOHN RYAN: Are you studying at the moment a proposal to use portal emissions for anything other than absolute and utter emergencies within the tunnel?

Mr GALLAGHER: The answer is a simple no.

The Hon. JOHN RYAN: What is the explanation for the paperwork I have just handed to you, which appears to be that very thing?

Mr GALLAGHER: We have an obligation under 73/8 to investigate portal emissions. We were looking at those investigations, but they have ceased.

The Hon. JOHN JOBLING: No further action has been taken?

Mr GALLAGHER: No.

(Documents tabled)

CHAIR: Ms Stricker, I have a memo from you to Vicki Sheppeard dated 15 May 2002 re RAPS. I will read it to you:

> We were planning for you (that is the Department of Health) to attend the Community Liaison and Air Quality Control Consultation Committee in July.

This evidently was delayed and you say:

> RAPS have two representatives on this committee but it represents the wider community. The non-RAPS members of the committee are very concerned about the special treatment that RAPS gets from the Government, the outcomes of which are not always consistent with the views or needs of the broader community. This was the reason why we suggested that you attend the broader community meeting rather than meeting with RAPS alone.

There was a meeting then in July and I have an email from Penny Finlay to Liz Corbyn and others:

> The attendance of NSW Health at the next RAPS meeting has been put off until early August by RTA as the new committee will have their first meeting on 8 July.

There is also a memo written by Vicki Sheppeard, which we looked at last Friday, in which she says that the RTA wants to delay Health's attending until the August meeting. Could you explain why RTA continually wanted to delay the attendance of NSW Health at these meetings?

Ms STRICKER: It was not a matter of continually delaying the appearance of NSW Health at the meetings. The previous community liaison group was the AQCCC or the Air Quality Community Consultation Committee. That group was reconstituted for the ongoing operational phase of the motorway as the Air Quality Community Liaison Group. Because we were expecting new members to appear on that group, we thought that, considering that the health study affected the broader community, it would be most appropriate to have NSW Health come to that first meeting. There also was one month I think, maybe even two months, in that period where we actually did not have a community meeting. Because of that changeover, we had to advertise for new members and invite them to appear at the group meetings, and also the chairperson was on leave for some period of that time, on maternity leave, so there are a number of factors as to why there were delays in having that meeting and inviting NSW Health to appear.

CHAIR: Can you advise the Committee whether or not the question of air quality and the health of people of New South Wales using the tunnel was discussed at any of these meetings, that is the internal air quality as opposed to external air quality?

Ms STRICKER: I do not have a clear recollection that in-tunnel air quality was discussed. I myself, I think, was not present at both of the meetings that NSW Health attended, so I cannot be sure of that.

CHAIR: That is consistent actually. We have had evidence from Baulderstone Hornibrook that the particulate matter within the tunnel reaches 2000 micrograms per cubic metre. You would be aware that the external limit is 50 micrograms per cubic metre. Were you aware that that level had been reached inside the tunnel?

Ms STRICKER: No, I have not seen any figures to that effect.

CHAIR: Those figures can be provided to you, if you wish. They were able to go through their submission and explain what the various levels were and it seems that the average is something like 800 to 900 micrograms per cubic metre within the tunnel. Would that surprise you?

Ms STRICKER: In certain periods, no. You must remember that there are two tunnels. I am not sure of the origin of the data to which you are referring.

CHAIR: It is from Baulderstone Hornibrook.

Ms STRICKER: Well, I am sorry, I have not seen the data, I have not discussed it with them.

Mr FORWARD: If you would like to provide the information to us, we can respond to it.

CHAIR: The submissions will be public and no doubt you will get one.

Mr FORWARD: Well, as I say, if you would like us to comment on it, we would be happy to do that.

CHAIR: No one has actually been monitoring as a separate entity the particulate matter by volume, only by visibility, and the evidence we had from Baulderstone Hornibrook was that there is a method of using visibility to transfer into micrograms per cubic metre. It appeared from the evidence, and they seemed to know what they were talking about, that the levels were extremely high in there and my reading of those figures is that, if a person were to go through the tunnel twice a day for, say, seven minutes, if the external air quality was 40 micrograms per cubic metre, people going through the tunnel would actually receive an overdose, it would be well over 50 on a 24 hour average. It seems to me that if you were concerned about the health, not only of the motorists but particularly your employees, you would not expose them to this level of carcinogenic material within the tunnel, that is just particulate matter alone, bearing in mind that we have received evidence that the particulate matter in the tunnel is actually more dangerous than the PM10s outside the tunnel because it is mostly from diesel and PM2.5 is actually much higher in diesel than it is in general air quality, so I would ask that you have a look at this with some degree of urgency if you are interested in the health of your employees.

Mr FORWARD: I have undertaken to do that.

(The witnesses withdrew)

(Short adjournment)

PETER CHARLES MANINS, Chief Research Scientist, CSIRO Division of Atmospheric Research, 107-121 Station Street, Aspendale, Victoria, sworn and examined:

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr MANINS: I am.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee will consider your request but it may be overturned by a vote of the Legislative Council. Would you like to make an oral presentation?

Dr MANINS: I would like to do that via some overheads. The first slide talks about the proposed variation to the air National Environment Protection Measure to cover PM2.5, that is particles less on an average than 2.5 micrograms in diameter. It introduces a standard for the particles for the first time in Australia by the National Environment Protection Council on which each of the States has a representative or more. This variation can be found at the web address: www.ephc.gov.au/nepms/air/air_variation.html. The standard is proposed – but yet to be signed by the NEPC but it is imminent – that particles as PM2.5 for twenty-four hours exposure must be less than 25 micrometres per cubic meter and for one-year exposure less than eight micrograms per cubic meter to apply only at performance monitoring stations, that is stations that represent the general exposure of the population to particles.

Why PM2.5? While health affects have been observed for all sized particles, PM2.5 is known to penetrate deeper into the lungs than the larger sizes of particles and is retained preferentially to the larger sized fractions in the lungs, where they to their damage. The next slide shows monitoring results for PM2.5 from NSW EPA monitoring and these results can be found in the NEPM variation I mentioned before. Liverpool up to 119 micrograms per cubic metre, the 24-hour average down to 2 -- remember the standard is supposed to be for 24 hours – 25; at Lidcombe and Richmond up to 83 down to three and up to 101, down to two and annual values between six and eleven for the same stations. The annual value will be rather difficult to meet in New South Wales because the proposal is for eight; the 24-hour value could well be met, it depends on circumstances such as bushfires and brief events. These are measured are by TEOMs – I am corrected -- so they are fairly reliable.

The next slide presents what is generally regarded as very new information, in the past two years; in fact the lower part of the slide showing the long-term effects of fine particles was only reported this year. The table shows PM2.5 studies and response relationships, showing for example, if there was a 10 microgram per cubic meter increase of PM2.5 daily average, then mortality, deaths, are expected to go up by 2.3 percent. If the problem is cardiovascular diseases then it is expected to go up by 1 percent; for respiratory diseases in general, up to 8.6 percent increase of deaths in the community per 10 micrograms per cubic meter increase of fine particles. These are the short-term effects. The longer term effects, and again this is very new information, for chronic exposure to particle levels for every 10 micrograms increase, there is about a six percent increase in deaths over the standard death rate, which in Sydney is around about six deaths per 10,000 people per month; about 60 or 70 deaths per 10,000 people per year. For example, if the community numbered 10,000 people around the M5 and if they represented the general population -- and I do not know that – then on average you would expect 60 or 70 deaths per year in that community due to all causes. If the chronic pollution of fine particles PM2.5 was increased from 10 to 20, then you would expect an extra six percent deaths in that community from all causes. If you have a pre-existing illness such as lung cancer or cardiopulmonary diseases the expected death rate is even higher, 14 percent and 9 percent.

The next slide is motor vehicles as a source of PM2.5. Diesel vehicles contribute between 60 and 80 percent of all particle emissions from the vehicle fleet in general. Ninety-eight percent of the particle emissions from diesels are smaller than PM2.5, in other words effectively all diesel emissions of particles are PM2.5; 91 percent for petrol vehicles -- and these are both for well-maintained vehicles. Poorly maintained vehicles can emit a lot of the bigger particles; but for well-maintained vehicles they are very small and therefore can penetrate deeply into the lungs of people.

This slide shows the difference of particle emissions from diesel vehicles compared with conventional petrol vehicles and various other technologies. You can see diesel vehicles emit very much more mass of fine particles than petrol vehicles, by volume, mass per cubic meter. The next slide shows the Australian diesel fleet. There has been work undertaken for a diesel NEPM -- National Environment Protection Measure. One of the pieces of information that can be found at www.ephc.gov.au/pdf/diesel/Diesel_NEPM.pdf, is that all sized diesel vehicles have, I think, a significant failure rate of particle emissions -- all sizes and all ages except for the really larger vehicles greater than 25 tonnes that are middle-aged or older and they are generally very well maintained. The failure rate there of particle faults is quite low; but for new vehicles, old vehicles, light vehicles, middleweight vehicles, all have a 10 percent or more failure rate in terms of particle emissions; they emit visible smoke is the general test; this is not good but this is the Australian situation. This is rather different to the European situation because the Europeans are rather more assiduous in checking vehicle emissions and therefore maintaining their vehicle fleet.

I have access to some data from the M5 tunnel and in the brief time available to me I looked at a small amount of that data to try and workout a few interesting things that might give an idea of what questions could be asked if one had good access to the various data now becoming available from the traffic and emissions monitoring. To ask the questions I want to draw out - I have picked a particular day, 7.00 a.m. on 6 June 2002 -- not for any special reason just that everything was available to me for that day, many other days were also available -- total traffic count was 3% higher than design. That indicates that the tunnel was running on that day at about the design level. Interestingly the medium and long vehicle count was only half of design -- just think if it was full design? The medium and long vehicle count are almost certainly all diesels and almost certainly emitting most of the fine particles. The particle emissions in the tunnel would probably be something up to twice as high if the tunnel was actually operating at design as far as the medium and long vehicles were concerned. Something has not been correct in the estimate of traffic for the tunnel in terms of the ratio between short and long vehicles. NOx emissions were only a third of the design and that is a very positive result in terms of air quality, but strange it is so low compared with the design. Here is another question that should be asked of the full data set. The particle emissions were about 84 percent of design. At first sight that also looks interesting but when you recognise the medium and long vehicles were only half of the design, you wonder why the particle emissions were that low or they could be a lot higher.

If you then take the assumption that only the medium and long vehicles emit particles, because they are all diesel and because they are the larger diesels and the bigger the engine generally the more particle emissions -- but that is not entirely true -- if you scale it up to 100 percent for the medium and long vehicles you will see particle emissions would be almost twice the design level. So to be flippant somewhat, if you think it is bad now imagine what it could be like if it was running at design level? Of course there are problems with this simplistic analysis in that some of the short vehicles are diesel and all short vehicles emit some particles; so it is giving a pointer to what ought to be asked of the data.

We have focused on diesel vehicles, but let me just remind you that solid fuel heating in the region is an issue and it is certainly also a source of fine particles, PM2.5, and more than 90 percent of smoke from solid fuel heating is also PM2.5. In the cooler months, smoke is about 60 percent of the PM10 and 68 percent of the PM2.5 emissions in urban areas. These are quotes out of the particle NEPM that I mentioned before, the particle variation. Sydney has a particular problem that not only in the winter are particles often high, but also in the summer because of bushfires, prescribed burning, waste burning and agricultural burning. The smoke from those sources is also largely PM2.5, so Sydney gets it two times a year, winter and summer, especially this year.

Finally I would like to note that not only is there now quite a bit of data available for the in-tunnel monitoring and that this data should be looked at quite seriously, but there is more and more data now starting to become available for the ambient monitoring and most of it is not so ambiguous as it was at first when the fans were not operating all too often.

I have looked at two sites, the community based monitoring station and X1, which is just to the north-west of the stack, and I just wanted to note a couple of things by looking at the pollution roses. The next slide is for the community based monitoring station, which is to the south-west of the stack. Its intention is to pick up the highest ambient concentrations of particles and NOx from the stack and, via picking up the highest, to

then be able to estimate exposure in the whole region. You can see that these pollution roses are in June this year. The density of points shown on the pollution roses is quite high from the south, from the west, from the north, and quite low from the direction of the chimney stack, both for NOx and for particles. This does not mean that the stack is having no effect, it just means that it is not having an effect very often. The majority of the cause of pollution in the region seems to be, in June, coming from other wind directions, not from the stack direction.

The final slide is the one to the north-west of the stack where most of the people who seem to be directly affected are located, again in June. There are some cases where there are elevated pollution levels from the stack, it is not clear what those levels are without further analysis, but the vast majority of the time the pollution is coming from other wind directions, so it would appear to me that the other controls that are under way, the other efforts to reduce the use of wood smoke, the buy-back programs and such things, are very important to reducing exposure of the population to elevated pollution levels, but that is not to say the stack is not important. I agree that the stack can be important, but very rarely.

CHAIR: We have heard evidence from Baulderstone Hornibrook, based on the visibility data which they presented in their submission, that the average micrograms per cubic metre in the tunnel as opposed to outside the tunnel is something like 800 micrograms per cubic metre on average throughout the year and it has reached as high as 2000 micrograms per cubic metre, sometimes 1000 and sometimes 2000, it obviously varies quite a bit. As you pointed out, something like 98 percent of diesel fumes are of the lower range of particulate matter, PM2.5s and below. It seems to me that, if we have a standard of 25 micrograms per cubic metre of PM2.5s on a 24 hour average, if a person were to go through that tunnel, either a motorcyclist or a motorist with their windows open, they would be exposed to something like, on a 24 hour average, a quarter of their daily exposure just by going in and out of that tunnel. Have you done any figures on that at all and do you know of the particulate matter levels inside the tunnel?

Dr MANINS: I have heard of levels being mentioned that are consistent with the numbers that you mentioned before. You are being quoted numbers that are from visibility?

CHAIR: Yes.

Dr MANINS: So they are generally not directly measuring mass of particles, they are measuring a light scattering, a light scattering method, so there would be some argument about the precise number, but we are only talking 10s of percent at the most, but the point is quite strong that the levels are very high in the tunnel.

CHAIR: Do those figures make sense, broadly speaking, to you?

Dr MANINS: Yes, they do.

CHAIR: It strikes me that it is such a high level inside the tunnel that, if people have to go through that on a daily basis, they would have a very high exposure, even higher than people outside the tunnel where it is more dispersed?

Dr MANINS: Yes, I would agree with the estimates that you have made. It is not clear what the consequence of that exposure is, so there needs to be some consideration of that. The exposure is brief, yet the evidence that we have that forms the basis for the air quality standards I talked about before is 24 hour average exposure. It is not clear from the data used to derive those relationships, those epidemiological relationships, how a narrow spike, a spike of 10 minutes' exposure once a day, would relate to the 24 hour average that might be Sydney-wide.

CHAIR: If there were, say, 20 micrograms per cubic metre of PM2.5 and they have an exposure to, say, an extra eight going through the tunnel twice a day, it might well exceed their daily level, but, as you say, we do not actually know what a spike does, whether it averages out over the 24 hours?

Dr MANINS: That is correct. As far as I am aware, we do not know how to average that spike out.

CHAIR: Have you any idea when a PM2.5 standard will come in?

Dr MANINS: As a standard, I think 2005. What is coming in very soon, either this month or next month, is a goal, the objective of which is to facilitate a review of the standard to commence in 2005, so the expectation is that it could be regarded as a standard against which performance is judged by around 2005, but again that is a standard for background monitoring stations, performance monitoring stations. That is not the same as roadside exposure or in-tunnel exposure where there are assumptions that you are exposed in those regions quite briefly. You are supposed to be through that tunnel rather quickly, although I understand that is not always the case.

CHAIR: Do you know of any standards emerging in Europe for PM2.5 or PM10 either in-tunnel or outside tunnels?

Dr MANINS: I am sorry, I am unaware of whether there is work or not.

The Hon. MALCOLM JONES: Just looking at the monitoring pollution roses that you produced, I am thinking that the smoke plume from the stack is not really impacting.

Dr MANINS: That is one reason to have a stack, to try and minimise the exposure. The design modelling that was done for the stack shows that the levels ought to be low all through the day. If they are going to be high they would almost certainly be high only in the evening or night-time when there was very little vertical mixing in the atmosphere. On those occasions, which are fairly rare at any particular point, the levels could be quite high, briefly.

The Hon. MALCOLM JONES: So from the monitoring points would you conclude that the stack is working satisfactorily?

Dr MANINS: I cannot judge that, I have not had an opportunity--

The Hon. MALCOLM JONES: Only from the point of view of these roses.

Dr MANINS: I cannot judge that without looking further at what is being emitted - I do not have enough data on that - at the same time as what is being measured in the ambient. You have to relate the two. It is all too easy to be confused between emissions, say, from the airport coming into the region and thinking that that was due to the stack, or vice versa. I do not know. You would need to do the analysis.

The Hon. JOHN JOBLING: What I am going to put to you is hypothetical, but in the event that it is resolved to increase or to go to portal emissions, the four different areas, with this being emitted at ground level rather than at 35 metres plus air velocity and heat to force them up, what sort of area would you be looking at or would you contemplate that one should make an examination of effect? I realise that the terrain makes it difficult.

Dr MANINS: One of the problems is that the eastern end of the tunnel has a 1 in 12 grade right at the portal and that means that the diesel vehicles, the bigger vehicles, are all running at full load as they exit that tunnel. They are all operating at full emissions. At the eastern end I guess I would expect, if there were portal emissions, a rather substantial impact of many portal diameters around the portal. At the western end there is a 1 in 12 grade, but it is actually outside the tunnel and that means that the maximum emissions are already occurring from the vehicles individually just outside the tunnel at the western end. Portal emissions would add to that, but the gradient is less and therefore the emissions would be less just inside the tunnel. Again, many portal diameters would be affected.

The Hon. JOHN JOBLING: Are you aware of any specific studies that have been or are being undertaken by anybody to look at the question of what would happen if this proceeded and under 73/8 they do go to portal emissions?

Dr MANINS: I am unaware of any studies being discussed. I would expect such studies to be undertaken, but I am unaware that they have been commissioned.

The Hon. JOHN JOBLING: As a specialist in an atmospheric pollution program, what reasons could you perhaps advance for what they are finding at the stack? The gaseous emissions are between 8 and 10 percent higher in temperature than was predicted. Would you care to venture some thoughts as to why?

Dr MANINS: I did not know that, but it is entirely consistent with what CSIRO expected and it was also stated in the design that they chose to take the temperature of emission the same as ambient to be conservative, to overestimate the ground level concentration and therefore provide some safety factor, so if the stack emissions are several degrees above ambient, that is a positive thing as far as dispersing the pollutants, sharing it over more people at lower concentration.

The Hon. JOHN JOBLING: That is the final question I was going to put to you, that you would therefore expect, providing there was some breeze, a much higher rise of exhaust gases. Is there any modelling to show the effect of a plume strike of these gases being greatly increased in any one or two particular areas as opposed to the modelling strikes?

Dr MANINS: I am a little confused about your question.

The Hon. JOHN JOBLING: I am looking at, "yes I expect that they will go higher as they dissipate out." There was modelling down to show they would expect impacts because of wind in certain areas of the gas. Is there any work being done to see where this might extend to and so a surprise effect, cumulative in another area?

Dr MANINS: I do not believe such work has been done but I would not expect a surprise, nor would I expect a great increase of plume height because of eight or ten degrees excess of temperature. That is not very much really so there would only be a small incremental improvement in the height of rise.

The Hon. JOHN JOBLING: It was put to us the increase was a result of (1) increased traffic, (2) increased exhaust emissions, (3) the fact the tunnel is sandstone encased and therefore warms up and (4) the increase in fan usage because of the velocity of air.

Dr MANINS: There is no increase of traffic, it was running at a design level as far as I could tell but perhaps you have other evidence that is more broadly based.

The Hon. JOHN JOBLING: They put to us it was designed at this stage for about 72,000, was averaging 82,000 and had hit 92,000.

Dr MANINS: As I said earlier, I believe that the design intention was there would be no increase of temperature at emission and that was to give a conservative result. Any increase of temperature, whatever the reason -- and of course the reason is motor vehicles emit warm gas by combustion -- the extra temperature is a small benefit, it is a positive for the environmental dispersion of the pollutants.

CHAIR: On your PM 2.5 studies and those responses you talk about the increase in deaths as a result of 10 micrograms per cubic metre increase in PM2.5, was that per annum or on a daily basis?

Dr MANINS: In the table, slide six, there is information for daily and lifetime. The long-term effects I mentioned from all causes are about six percent increase of deaths.

CHAIR: That is an increase of ten micrograms per cubic meter on a daily basis over a lifetime?

Dr MANINS: That is an average exposure over the lifetime of a person.

CHAIR: You have the annual target standard goal at eight micrograms per cubic meter.

Dr MANINS: That is right.

CHAIR: If 10,000 people use the tunnel regularly on a daily basis to and from work and are exposed to something like 800 micrograms per cubic meter of largely PM2.5's, their annual exposure would equal the annual standard?

Dr MANINS: It could well. The problem that I face is that this is a spike, a short-term exposure every day; and from what I understand I do not know how to relate that short-term exposure and how to average that across a whole lifetime or even a whole day.

CHAIR: PM2.5's are water-soluble?

Dr MANINS: No they do not have to be water-soluble.

CHAIR: Are they not largely water-soluble?

Dr MANINS: They are all spheres because they are all pretty much hygroscopic, they have water bound around them mostly, there are very few that are not.

CHAIR: If one took seven minutes of deep breaths inside the tunnel at a very high level of 800 micrograms or up to 2000 micrograms per cubic meter, surely that would be equal to around about eight per day roughly?

Dr MANINS: I do not know.

CHAIR: It strikes me there is a black hole in the monitoring, they are not looking at exposure, short term albeit, to up to 50,000/60,000 people a day. According to your theory of a six per cent increase in deaths, that could be an increase of 50 people per year. On the basis of that short-term exposure, if you can extrapolate that over a 24-hour period, is it still the same?

Dr MANINS: Yes but there are so many "if's" there.

CHAIR: At that level it is clearly not a healthy place to be?

Dr MANINS: It is a most unhealthy place clearly and people who actually work in that tunnel are at substantial risk.

CHAIR: Earlier Mr Paul Forward said it was a breathable atmosphere inside the tunnel.

Dr MANINS: I understand Nick Greiner is quoted in the press as saying that. I presume you can get some oxygen out of the air at the same time as you breath in and out.

CHAIR: If we were able to do research to show a spike fifteen to twenty minutes per day would lift your average by another eight on an annual or daily basis, it could be substantial. Do you not think it would be worth putting filtration in the tunnel to remove a considerable portion of those particles?

Dr MANINS: I cannot interpret what I understand the epidemiological studies have shown, the relationships which are based on average exposure is over twenty-four hours or over lifetimes; but clearly there are issues that the tunnel air quality is far from acceptable. Removal of particles in the tunnel would have benefit to those people in the tunnel and to those people outside exposed to vent emissions so it would be very positive for both parties.

CHAIR: Would it serve to reduce levels of benzene, formaldehyde and particulate matter to a greater extent?

Dr MANINS: Almost certainly not if the device to be used was electrostatic precipitators; they only

remove particles –

CHAIR: Would it be a combination of benzene with the particles?

Dr MANINS: There would be some liquid benzene but most of it would be gaseous.

CHAIR: There would be an initial benefit, perhaps?

Dr MANINS: A small benefit but probably a side benefit; a positive, yes.

CHAIR: We have been hearing from the RTA and the Minister for a long time electrostatic precipitators do not work, have no effect, and it is a placebo. It seems we have a serious problem within the tunnel and a quantifiable problem outside the tunnel. We have had a number of people give evidence they have suffered since the stacks went in, even though the levels have not reached above the target of 50 micrograms per cubic metre, they are still suffering. You have a problem both outside the tunnel, which a number of people have complained to the department of health about, and certainly it is a serious potential problem within the tunnel. I guess then you would be supportive if we were able to remove portion of those PM2.5's and PM10's from the tunnel?

Dr MANINS: I believe a lot of the argument earlier on was about filtration at the vent, where the flow rates are quite large so the technology was said to be unproven or at the leading edge. We are not talking about that now, I understand we are talking about filtration in the tunnel. If we put filtration on the exhaust perhaps we would still have the problem in the tunnel so the delay has probably been a good thing as far as tackling the real issue which is primarily inside; and by cleaning up inside one would have a consequential benefit outside; where before you would have had to consider putting filtration in the tunnel having spent a lot of money putting filtration on the vent itself.

The Hon. JOHN RYAN: One of the measures we have been given to consider with regard to in-tunnel air quality is PIARC95. Are you familiar with how it measures particulate matter by comparison to the standard parts per million like PM10 and PM2.5? Is it a more rigorous or a less rigorous means of measuring?

Dr MANINS: I am sorry I am unfamiliar with the particular PIARC report; I did not know it existed until recently. I thought I was looking at the correct PIARC report when reviewing the emissions design but apparently there are other reports on how to design the air pollution not to be excessive in the tunnel. I am unaware of the detail in those reports – I mean I will find it.

The Hon. JOHN RYAN: When you look at particulates whether PM2, PM10 or whatever, we have largely considered petrol and charcoal particles the same in terms of health quality with the exception smoke particles tend to be smaller. Is there any difference between diesel produced particulates and wood-fire particulates? We have been used to breathing smoke since we crawled from the slum. The human body is not used to breathing diesel, which includes chemicals and other particles that might make that measurement complex. Is there an air quality benefit if we substitute diesel particles for wood-stove particles, because that is one of the means of dealing with air quality? Do we have the same air quality or different if we substitute one for another?

Dr MANINS: I believe the evidence on which the variation to the air NEPM is based shows there is no clear difference between the kinds of particles whether they are diesel, wood-smoke particles or whatever, the same relationships between exposure to excessive levels and deaths or illnesses still hold. That is across, now, hundreds of thousands of people – on many hundreds of millions of people those studies have been run. The study on chronic exposure I mentioned earlier was based on tracking 500,000 people in the US for twenty-odd years.

The Hon. JOHN RYAN: We know there are no goals set for the tunnel with regard to short-term exposure to a high concentration of particulate matter. Are the relevant standards that might be applied for short-term exposure to hight concentrations of particulate matter?

Dr MANINS: Yes I believe the occupational health and safety limits are the minimum one could expect to apply. I am unaware of what the occupational health and safety level is but that would have to be the minimal acceptable standard preferably because the general public is being exposed, one would go for a lower maximum than the occupational health and safety standards. Occupational health and safety standards are probably several hundred micrograms per cubic meter. I am informed of that.

The Hon. PETER PRIMROSE: Going back to your Australian diesel fleet table, in terms of looking at the mass of vehicles under 3.5 tonnes it seems the table brings out the vehicles with the most significant particle emission faults would be four-wheel drive vehicles between six and twenty years old. What does that actually mean?

Dr MANINS: The table I presented earlier shows that in a survey on diesel vehicles of the older diesel vehicles less than 3.5 tonnes in weight about thirty-two percent had significant particle emission faults; vehicles less then 3.5 tonnes diesel in the Australian fleet are mostly light delivery vehicles, light commercial vehicles, a lot of them are petrol too but we are talking about diesel vehicles here. They would be light commercial vehicles; they would include four-wheel drives but four-wheel drives have become much more popular only in recent years so they would be in the column for vehicles less than five years old, about thirteen percent of vehicles have faults even though they are quite new. The implication is that an unacceptably high number of diesel vehicles on our roads have faults with particle emissions. I understand EPA in New South Wales has been striving for a little while and is soon to implement – if it has not already - a vehicle inspection program designed to look at pollutant emissions and that would be particularly focused on particle emissions. This is highly desirable.

The Hon. PETER PRIMROSE: That discussion to date has largely been about trucks, when people talk about diesel we have been talking about doing something with our truck fleets, even under five years old those vehicles under 3.5 tonnes still account for amongst the highest significant particle emission faults?

Dr MANINS: Yes.

The Hon. PETER PRIMROSE: I understand that includes not only light commercial vehicles but also -- and can you differentiate -- passenger four-wheel drive vehicles?

Dr MANINS: They are all covered, and I believe you are quite correct and, what is more, the light diesel vehicles are the fastest growing fraction of the vehicle fleet in Australia. If they are not a problem yet, they will be, but then again the European standards are also coming in and they are particularly focused on diesel vehicles, so there is a race between increasing number of diesel vehicles and strongly restricted emission performance coming in with Euro 3 and Euro 4 standards.

CHAIR: Have you any figures as to what proportion of the total particulate matter is from faulty vehicles as opposed to non-faulty vehicles?

Dr MANINS: The Federal Office of Road Safety commissioned a report around 1995 that showed about 80 percent of pollutant emissions were from less than 20 percent of the fleet.

CHAIR: And they were basically faulty?

Dr MANINS: They were basically faulty, yes.

CHAIR: So we could reduce particle emissions by 80 percent if the RTA introduced testing and did not allow these vehicles to pass the test.

Dr MANINS: I won't answer that.

(The witness withdrew)

GREGORY JOSEPH STEWART, Chief Health Officer, NSW Health, 73 Miller Street, North Sydney, sworn and examined, and

STEPHEN JOHN CORBETT, Acting Director, Health Protection, NSW Health, 73 Miller Street, North Sydney, and

VICKY SHEPPEARD, Acting Associate Director, Environmental Health, NSW Health, Victoria Road, Gladesville, affirmed and examined:

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr STEWART: Yes, I am.

Dr CORBETT: Yes.

Dr SHEPPEARD: Yes.

CHAIR: If you should consider at any stage during your evidence that, in the public interest, certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee would be willing to consider your request, but it may be overturned by vote of the Legislative Council.

Would you like to make an opening statement?

Dr STEWART: Yes, I will make an opening statement, which will take 15 minutes or so, and then either Dr Corbett, Dr Sheppeard or myself will respond to questions from the Committee.

Chairman and honourable members, this presentation is to provide the Committee with an overview of current NSW Health activities in relation to the M5 East tunnel and also to provide information on the NSW Health perspective on the operation of the tunnel. Several of the terms of reference are obviously pertinent to the work of NSW Health and, whilst we are happy to have questions during the presentation, I think it is likely that a lot of the issues will be covered in the presentation.

This slide is about NSW Health involvement in the regulatory and advisory aspects of the operations of the tunnel. It is important to emphasise, first of all, that NSW Health has no legislative or regulatory requirements to participate in the assessment, we are not a conditioning authority in this tunnel or other tunnels. However, we have been consulted at various stages of the planning and assessment of the M5 East both by other government agencies and by community groups. NSW Health provided advice regarding emerging national environment protection measure goals for air quality and advised that tunnel performance should be assessed against these goals rather than the less stringent goals in place at the time. NSW Health also provided advice that a stack of 35 metres in size would better provide for better air quality outcomes than a shorter stack. NSW Health also recommended that in-tunnel air quality should comply with the WHO 15 minute goal. That is a goal relating to carbon monoxide.

I now move to health and safety issues in the tunnel. The primary consideration in tunnel safety is fire control and management, but clearly issues related to this are beyond the expertise of NSW Health and so I will not deal with this matter further. There are numerous aspects relating to preventing and managing vehicle accidents that are also critical in the safe performance of a tunnel. These are also substantially outside the expertise of NSW Health.

Air pollutants are related to tunnel health and safety in several ways and I will deal with these now. Motor vehicles and, as we have heard from earlier presentations, particularly diesel vehicles are a major source of air pollutants in a city such as Sydney. In a tunnel setting, pollutant levels may reach much higher levels than usually found near roadways. Key motor vehicle pollutants of concern are fine particles, carbon monoxide, nitrogen dioxide, benzene and other organic compounds. Fine particle levels are principally controlled in tunnels to ensure adequate visibility for safe driving. The M5 East tunnel is managed to comply

with international standards for visibility. At present the shortest time period of fine particle exposure known to have an effect is 24 hours, but research currently under way or planned is examining the effect of particles on health over shorter periods. At present there are no guidelines against which particle exposures in the tunnels, because of the short-term nature of that, can be compared.

The next slide is about carbon monoxide and I will just give you a bit of basic scientific background. Carbon monoxide's effects on health have been well understood for longer than several decades. Carbon monoxide exerts its effects through binding with the proteins in red blood cells that usually carry oxygen to the tissues of the body. This results in a relative lack of oxygen in the body. Effects are most pronounced at the most oxygen sensitive organs, the heart and the brain, and also in foetuses. Individuals with pre-existing coronary artery disease may experience angina at certain levels of carbon monoxide. Effects on the brain may be experienced as headache, confusion or impaired performance and this may include impaired driving performance. The foetus of a pregnant woman is also sensitive to increased levels of carbon monoxide and this is thought to be the mechanism for low birth weight babies, the association between smoking and low birth weight babies. The World Health Organisation has established guideline values for maximum safe carbon monoxide levels for different periods of exposure. Carbon monoxide gradually builds up in red blood cells over time, so the longer an individual is exposed to carbon monoxide, the higher the levels in the red cells become.

The next slide shows the World Health Organisation guidelines. I would like to put these guidelines in some context. Average levels in Sydney are usually 2 to 3 parts per million over eight hours with even the peak site in the central business district usually below 9 parts per million. Alongside major CBD roadways during peak hour levels may be in the vicinity of 25 parts per million over an hour and in a clinical comparison for collapse due to high levels of carboxyhaemoglobin, that is levels of greater than 50 percent in the blood, the amount of exposure required would be 3000 parts per million for 15 minutes, so there are some clinical and other comparisons in terms of carbon monoxide.

During assessment of the M5 tunnel it became established that the tunnel was likely to have high traffic flows from soon after it opened and this has been the case as the Committee is well aware. During high traffic flow periods it seemed likely that motorists would be in the tunnel for longer than the normal six to seven minutes for transit time in the tunnel. NSW Health, in consultation with the New South Wales EPA, provided advice that the air quality in the tunnel should comply with the WHO 15 minute guideline. This was set in a condition to the effect that the tunnel should be designed and operated so that the WHO 15 minute carbon monoxide goal of 87 parts per million, the level on the previous slide, is not exceeded under any conditions.

NSW Health has been advised by RTA of episodes on eight days when the carbon monoxide levels at a point in the tunnel had exceeded 87 parts per million averaged over 15 minutes. The RTA has provided NSW Health with further information about these incidents, including carbon monoxide levels at the other monitors - there are 10 monitors in the tunnel - and the traffic speeds through the tunnel at that time. As a consequence of that we undertook an analysis of the information provided and this demonstrated that it is unlikely that any individual motorist was actually exposed to levels of carbon monoxide over the WHO 15 minute guideline. I emphasise here, Chairman, that that was on the basis of information and analysis, not on monitoring. It has been a focus of NSW Health involvement in this issue to ensure the tunnel is managed so that individuals are not exposed to high levels of carbon monoxide.

Nitrogen dioxide is another pollutant emitted by motor vehicles that is of concern to health. Nitrogen dioxide irritates airways and asthmatics are particularly susceptible to its effects. Nitrogen dioxide is one of the criteria pollutants monitored in ambient air. At present we do not have information regarding nitrogen dioxide levels in this tunnel and I am advised that this is usual international practice as only the pollutant of immediate critical concern, carbon monoxide, is routinely monitored in tunnels.

I turn now to benzene and toluene. Motor vehicles also emit a range of other compounds, including benzene, toluene, formaldehyde and acetaldehyde. If the levels are very high, up to 500 parts per million, there is the potential for immediate effects such as headache and eye or airway irritation. The more serious effects of these compounds, such as cancer, are unlikely to result from the level of exposure over the time spent in the tunnel. The lowest known cancer causing effect of benzene, for example, occurs over concentrations of 50 parts per billion over years of exposure.

My next slide deals with community perceptions and what NSW Health has done in relation to that since the opening of the tunnel. NSW Health has been alerted from various sources regarding community concerns related to air quality in the tunnel. Our sources include media reports, community contacts through participation in the community liaison group and direct correspondence including from the EPA. It is to be expected that pollutant levels in tunnels are high, however established effects of those pollutants occur over long periods of exposure, hours to years and time spent in tunnels is usually short. There are no goals or guidelines against which to compare pollutant levels experienced in tunnels for only minutes except for the carbon monoxide level, which I dealt with earlier. Studies overseas have shown that pollutant levels are lower inside vehicles that have windows and vents are closed. In prolonged delays pollutant levels are also reduced if engines are switched off; but anecdotal reports that NSW Health is aware of suggest that motorists can have their windows down and are reluctant to turn off engines even when requested to do so.

In response to the community concerns I have just talked about and a lack of research of exposure levels in this context and ways to reduce them, NSW Health has commenced a study of pollutant levels in vehicles using the M5 East tunnel. This is our in-tunnel study and that is the abbreviation we will use when you ask questions. This study is being undertaken by staff from the South Eastern Sydney Public Health Unit, a unit of the South Eastern Sydney Area Health Service, an administrative unit of the NSW health system. Data collection commenced in October with collection of in-cabin levels of fine particles, nitrogen dioxide, carbon monoxide, benzene and toluene under three different cabin ventilation scenarios. Measures are being undertaken during morning and afternoon peaks, samples will be analysed by the CSIRO, Melbourne. Analysis and reporting of results will occur over several months once this collection of air samples is complete. It is anticipated that the study will provide information on which to base advice for motorists of means to reduce pollutant exposure while using the tunnel. The study should also provide indicative levels of pollutants in the tunnel, some of which may be able to be compared to relevant health-based goals. NSW Health will be happy to provide the results of this study once it is completed.

The final two slides relate to air quality and health impacts for residents around the stack. I note that this term of reference includes impacts on workers and businesses. I limit my comments today to residents. The impacts on workers and businesses are unlikely to be greater than those on residents – I repeat that double negative – unlikely to be greater than those on residents as time spent in the vicinity of the stack for these groups, that is, workers and businesses is usually less than 40 hours per week and workers are typically considered to be "healthy" -- a term often used in epidemiology, "the healthy worker". NSW Health has received complaints from approximately eighty residents of headaches, eye irritation and increased or new asthma that have occurred since the tunnel opened. Representatives of NSW Health have met with residents on several occasions. Following from these meetings it was decided an investigation of these concerns should be undertaken. Initial assessment demonstrated that there has been no significant change in pollutant levels in the vicinity of the tunnel compared to the previous year.

Residents reported significant odour impacts however and officers of NSW Health believe that the health complaints may be odour mediated and we have briefed several specialists in chemical sensitivity, respiratory medicine and epidemiology on this situation. Following several meetings with these specialists, NSW Health has requested a proposal to investigate these complaints to determine if they are related to stack emissions. The time frame for that study will be months, six months would be the shortest but possibly longer than that. Health impacts related to odour is an emerging area of environmental health research. It is postulated that odorous compounds may cause symptoms below levels of exposure known to cause toxic effects and possibly these impacts are mediated by central nervous system pathways. The science and advice I have is that these may be learned associations. There is literature recently published by Susan Schiffman, which is helpful in understanding the phenomenon, and NSW Health if required can provide that to the Committee. That completes the presentation.

CHAIR: We were given evidence by Baulderstone Hornibrook their measurements of visibility can be translated into micrograms per cubic meter and they gave us the few examples: .005 visibility, the normal applicable for traffic situations travelling between 50 and 100 kilometres equals 1000 micrograms per cubic meter. The particulate matter within the tunnel is about 90 percent PM2.5 or less. The emerging goal for that is twenty-five micrograms per cubic meter per day or eight per annum on average. We have heard that if one

gets an increase in ten exposure you get a six percent increase in deaths. What are you doing to monitor the particulate matter within the tunnel? Are you aware if the average particulate matter within the tunnel is 1000 micrograms per cubic meter that would increase people's exposure something like 9.7 micrograms per cubic meter on average during 24 hours? In other words if they were going through the tunnel every day of the year they would exceed the entire goal for the year from the tunnel alone apart from what they receive outside the tunnel. Have you done any work at all to find out the effects of the this substantial amount of 2.5 and less particulate matter?

Dr STEWART: If I could address that broadly and perhaps Dr Corbett more specifically? The issue about exposure to particulates and increase in death rates has been known for a long time. There are many ecological studies, epidemiological studies, if you like, that show that association. The issue here is about overall exposures, average exposures of a whole population. Those studies that have been quoted have been done in cities. The issue about death rates is about the overall effect on the whole population. It is not appropriate in this circumstance to say there will be more exposure in one place without taking into account less exposure in other places. We do not have any evidence before us that the overall levels of pollution are going to increase as a result of this tunnel stack.

CHAIR: I am talking about exposure of 14 minutes per day for regular users in addition to whatever exposure they have outside the tunnel, which would be irrelevant because they have already received their total dose in the 14 minutes in the tunnel.

Dr STEWART: It is not their exposure outside it is other people's exposure outside and the decline in exposure for other people will be taken into account when you do your ecological study. For example we know that exposures on Stoney Creek Road are much lower than they were before the tunnel.

CHAIR: I am talking about people using the tunnel, the 40,000/50,000 people going through the tunnel each day. Some of those are motorcyclists who receive a full dose of particulate matter -- of course some get less -- and you are not measuring that.

Dr STEWART: The issue here is that studies quoted are about average exposures for overall populations, millions of people and therefore in deciding the average effect you have to take into account what a particular impact has on this group of people in terms of increasing and what it has on this group in terms of declining.

CHAIR: Surely if you can avoid the increased 40 or 50 deaths per year for people using the tunnel, you would do that?

Dr STEWART: I am not so sure that these figures are precise enough for us to have a conversation today about it. The point I am making is not about the fact there will be increased exposure, it is about using an average exposure over a whole population without taking into account the fact that in the roll-out of all these effects there will be impacts on a whole lot of different people. That is the important point I wanted to make.

Dr CORBETT: It is important to understand how these standards are derived. I think it is leading to a misconception about the possible impact of exposure during the tunnel. These standards or goals are derived on the basis of impacts of air pollution averages on the scale of a city on the number of deaths that occur in that city per day. Sydney, like many other cities, has an increase between three and six percent per day when you compare the days of highest pollution, to the days of lowest pollution. What all of those studies assume, in a city the size of Sydney, three million people - these studies have been done in Delhi, Shanghai and everywhere - there will be a population of people so the minimum exposure people would be exposed to is the average because you cannot escape pollution; but it assumes that there will tens of thousands, hundreds of thousands of people exposed to very high levels of pollution. That is how the science is done.

CHAIR: We all understand that.

Dr CORBETT: The important issue is there will be people who live beside roadways, there will be people who have experienced high level of pollution so the critical issue in assessing the effects in a tunnel is

going to be: Will it result in a net increase in the number of people being exposed to high levels of pollution? I wanted to make that clear.

CHAIR: That is an extraordinary statement. We are talking about a discreet population of regular tunnel users exposed to very high levels of particulate matter PM2.5, you cannot average it out and say, "We are going to lose forty people in the tunnel but save fifty people in other places because of the reduction in pollution there."

Dr STEWART: The discussion was about averages and ecological effects – about effects on whole populations and we wanted to make the point that the discussion needs to be on that line.

CHAIR: No I do not think you are right. We are talking about a discrete population who use the tunnel who are exposed to very high levels of particulate matter PM2.5 in addition to whatever they are exposed to during their daily life at home and work. We have heard evidence from a number of witnesses to show there are very high levels of PM2.5 in that tunnel and people who use it every day are exposed to fourteen minutes per day of very high levels of particulate matter if they are motorcyclists or have their air-conditioning on with the fumes coming inside. Forget about averages, we have to address that very discrete population.

Dr CORBETT: That is clearly a matter of concern to the people who use that tunnel; I do not think that is in dispute. The important point I was trying to make is that these standards, goals are set on the basis of air pollution levels on the scale of a city.

CHAIR: We understand.

Dr CORBETT: Within that population there are already many people in Sydney who because of their travelling arrangements will be exposed to high levels not in tunnels but on roadways, et cetera. If we are actually looking at this issue on the basis of preventing high exposures the critical issue for us to examine, from a health perspective, is whether the net number of people are going to be reduced. We also know we can reduce individual exposure by orders of magnitude, by simple measures such as closing windows and closing vents of cars. It is not a simple equation that travel through the tunnel is going to have a net increase on the number of people exposed to high levels of pollution.

Dr STEWART: We are not saying levels in the tunnel should not be reduced, we have not said that. We are saying if you start with an analysis based on whole populations, when you change exposures you have to analyse on whole populations. One of the issues is: What do the kind of levels you talked about earlier mean in terms of short exposure? We cannot answer that. I am doubtful anyone in the world can answer that, but it is not correct to say the department is not concerned about reducing levels of exposure to people within that tunnel -- of course we are.

CHAIR: How do you propose that the done?

Dr STEWART: There are various mechanisms - I will start broadly - about general pollution levels and how much particulates and other compounds are emitted by motor vehicles, particularly diesel vehicles and that is a worthy aim and the Department would always support aims that set about doing that. In terms of the tunnel itself, there are issues about ventilation -- in fact it is probably reasonable to take an ordinary health approach to this, which is about the vehicle, about the person and the environment. There are ways to do that in all three areas.

CHAIR: Have you considered filtration?

Dr STEWART: Filtration has been a matter of the discussion at this Committee before.

CHAIR: What is NSW Health's view on filtration?

Dr STEWART: Can you be more specific in your question?

CHAIR: In Japan there are sixty long tunnels of which forty-one are filtered by electrostatic precipitation and that reduces a considerable proportions of particulate matter whatever the reason - environmental, health or visibility – I would have thought NSW Health would have looked by now at the quantum of particulate matter in the tunnel, what it is doing to people and what is being done to reduce that. Surely the most obvious answer would be to look at filtration?

Dr STEWART: The reason for our in-tunnel study is precisely the question that you just beg, which was that we know about what is happening, we know about exposures, we do not know about exposures to the level we would like, that is why we are doing this in-tunnel study.

CHAIR: You are not ruling out filtration? Sure you say we could address the general question of diesel emissions, and that has not been addressed anywhere. We have a specific and urgent problem now where people are suffering outside and potentially inside the tunnel with a possible increase in deaths every year.

Dr STEWART: We do not claim to be experts in engineering and filtration. Advice we receive is from engineers and filtration experts. We claim to be experts in health effects; so the first question we ask is: What is the purpose of any policy in relation to filtration or any other matter? If it is an issue about outside the tunnel, stack emissions and so on, then it is quite a different question from an issue about inside the tunnel. It depends on what the question is.

CHAIR: I understand you wrote to Paul Forward on 19 August 2002 about air pollution in and around the M5 tunnel. Have you received a reply?

Dr STEWART: I am not sure our question was about outside.

CHAIR: In and around the M5 East tunnel.

Dr SHEPPEARD: In response to that letter we were invited to a briefing from Connell Wagner on the updates of their review of international tunnel ventilation practice.

CHAIR: And you went to that meeting with Connell Wagner?

Dr SHEPPEARD: Yes.

CHAIR: Did they tell you about the 41 tunnels that were filtered in Japan?

Dr SHEPPEARD: They certainly gave a rundown - I cannot remember the exact number of tunnels.

CHAIR: But you were aware of that?

Dr SHEPPEARD: Yes.

CHAIR: Well, apparently Paul Forward has no idea that there were 41 tunnels built in Japan, so the information has not filtered through to him.

The Hon. MALCOLM JONES: During the presentation you said that NSW Health met with 80 residents in the area and you made an initial assessment. When did this take place?

Dr SHEPPEARD: The first opportunity I think we had was in the air quality community consultative meeting that was convened in late June or early July and then we had a couple of other meetings, some with RAPS representatives and at other times the community liaison group meetings.

The Hon. MALCOLM JONES: Have you spoken to individuals about their medical complaints?

Dr SHEPPEARD: Yes, we have.

The Hon. MALCOLM JONES: You mentioned odour mediated and learned association.

Dr SHEPPEARD: Yes.

The Hon. MALCOLM JONES: Is that new age speak for psychosomatic?

Dr SHEPPEARD: No, it is not.

The Hon. MALCOLM JONES: What is it?

Dr SHEPPEARD: I did bring along the article by Susan Schiffman which I think is informative, and the Committee may like a copy of this. The distinction we need to make is that the air pollution levels that are being recorded are nothing like the level that could actually cause a health effect from what we know of toxicology and published studies, but when people perceive an odour then this can trigger responses in their body.

The Hon. MALCOLM JONES: Is that not psychosomatic?

Dr SHEPPEARD: Well, it is an actual chemical response that starts it, so it is not psychosomatic in itself. A chemical response to odour could stimulate the nerves in the body that then could trigger a response that could come out as asthma or headache, these kinds of effects.

Dr STEWART: Could I add one of the reasons that we are consulting with experts on this is for that very reason, Mr Jones: I think "psychosomatic" is sometimes used in a pejorative way. We do not use the term "psychosomatic", we say there are odour mediated effects and this is on the basis of quite new research and we are interested in finding out a bit more about that because we are aware of 80 people who have reported changes or new symptoms that were not there before. Now the department's view on this has been consistent, that there is no evidence in terms of general air pollution levels in that part of Sydney for anything to have led to that because there has been no real increase. There are spikes, of course, mostly in Sydney these days because of bushfire smoke, and so we therefore want to study these people more particularly and we will do that in a particular methodology that will compare them to people who are not having these effects.

The Hon. MALCOLM JONES: Your areas are in the general health of people in the community. Have you experienced deterioration in reported health standards?

Dr STEWART: The complaints that we have received are quite specific, as I understand it, eye irritation and perhaps other kinds of general irritation, headaches and either worse asthma or new asthma. Those are the complaints that we have had; those are the complaints that we are going to investigate.

CHAIR: Greg, this letter that you sent says, "I would like to request that further information be provided to the Department of Health on the infiltration systems". What is the feedback that you have had on that?

Dr SHEPPEARD: At the briefing that I attended from Connell Wagner, it seems that as yet there has been no new information that is available from these trial systems, or certainly no information that looked as though it would be helpful in this situation, but they are keeping a watching brief on these systems and will report back on a regular basis.

CHAIR: Have they given you information about the 41 Japanese systems that are currently working?

Dr SHEPPEARD: Well, a number, I am not sure if it is as many as 41. The information I have is that it is around 20.

CHAIR: We will have to follow that up, because we have one that says 27 and one that says 41, so we have to clarify exactly how many tunnels are in fact using filtration in Japan, but I would think you would want to know that information too, probably.

Dr SHEPPEARD: Yes, well, it is a substantial report and it was in draft form when I saw it, so we have not received the final report yet.

CHAIR: You were, I think, the author of a handwritten memo dated 4 July 2002 entitled M5 East Meeting. I think it is in your handwriting; you are probably aware of that. It is a report of that meeting and in it you talk about the RTA wanting to "delay Health attendance to August meeting!" Can you explain what reasons were given by the RTA for continually delaying your meeting?

Dr SHEPPEARD: This was in relation to our attendance at the community liaison group and once we received these complaints from the community I approached the RTA and asked if we could attend that community liaison group because it seemed to be a good vehicle to reach a broad spectrum of the community to follow up these complaints. I think it might have been in May that I spoke to the RTA, I cannot remember the actual date, and in fact there was not a meeting scheduled in June, but we were told that we could attend the July meeting. Close to that July meeting, the group was reforming from being the AQCCC to being the M5 Community Liaison Group and it was suggested that maybe we should wait until the new group formed, but as there had been some delay in being able to attend a meeting, because I think the June meeting was cancelled, I requested that we do attend the next meeting and not wait until August.

CHAIR: Can you tell me whether at any meetings you have had with the RTA the question of the problem of the in-tunnel air quality was mentioned, apart from carbon monoxide?

Dr SHEPPEARD: We have just been advised that visibility standards have been complied with and that is as far as we have talked about particulates.

CHAIR: So you did not get any information from Baulderstone Hornibrook about the levels of particulate matter in the tunnel at 1000 micrograms per cubic metre or anything like that?

Dr SHEPPEARD: No, I have not had any information.

CHAIR: If they had given you the information that they were having 800 to 1000 and sometimes 2000 micrograms per cubic metre in the tunnel, would you have reacted to that in any way?

Dr SHEPPEARD: Well, it certainly sounds like a high number, but we have no standards against which we can compare exposure over such a short time period, as Dr Stewart said, there is no established study. People have never been put in a chamber and exposed to high levels over a short period of time to know what the effects would be, so we have no basis against which to say what a safe exposure over a short time period to particles is.

CHAIR: It would not be healthy, would it; it would not be a good exposure, if you were in the tunnel for 15 minutes at those sorts of levels, or I do not think so. Do you?

Dr CORBETT: I think it is also important to ask ourselves the question: Is the exposure over the journey of people using this mode of transport more or less now than what it has been before? That is the critical issue in terms of individuals, and there may be an argument that there is some compensation travelling on a freeway. Now I think that is unproven, we do not really know the answer to that question, but I am just concerned about the simple assumption that travelling through this tunnel increases the exposure of individuals or groups in the way that has been portrayed.

CHAIR: We have heard that a minority of vehicles produce 80 percent of particulate matter. Dr Manins gave that evidence, which perhaps you heard. Some 32 percent of 3.5 tonne vehicles or less, referring to diesel vehicles, are faulty and 20 percent of 12 to 25 tonne vehicles six to 20 years old are faulty. Surely there would be a means of reducing the total particulate matter by working with the RTA to make sure that these faulty vehicles are not on the road. Has anything been done by NSW Health on that, do you know?

Dr SHEPPEARD: Well, we certainly were a participant in the development of the local air quality

management plan and one of the key strategies in that was to have a dedicated inspector for smoky vehicles in the region of the M5, so that is one targeted response in that area. Then, of course, there is the national diesel NEPM, the national environment protection measure for diesel vehicles. We have certainly supported the adoption of that in New South Wales.

CHAIR: You do not know if every diesel vehicle is tested annually to see whether it is faulty or not, though?

Dr SHEPPEARD: There is a range of responses that each State can provide to the diesel NEPM and that is one option that the State could implement, but the EPA and the RTA are implementing the diesel NEPM in New South Wales, so they would know the details.

CHAIR: It would appear on the basis of the information that we have received in the last presentation that we could reduce diesel emissions by 80 percent in the city of Sydney merely by ensuring that these vehicles are off the road until they are fixed. I would think that would be a priority for NSW Health, wouldn't you?

Dr STEWART: That would be a worthy aim, yes.

CHAIR: Will you be doing something on that, do you imagine?

Dr STEWART: Well, as Vicki said, the responsible authorities for the roll-out of that are the EPA and the RTA.

CHAIR: Health effects would come under your aegis, so I would think you would be working with the RTA and EPA to get these vehicles off the road.

Dr STEWART: We would be working with them for a range of strategies, as we do now, in relation to air pollution.

The Hon. JOHN RYAN: First of all, can I ask you about the in-tunnel study that you are proposing. What influence does the RTA have in the design or the outcomes of the study?

Dr STEWART: Can you just clarify that? When you say "influence", what do you mean?

The Hon. JOHN RYAN: Well, I have a document - admittedly it is from the EPA - which refers to your study and it gives the impression that the RTA is doing this study. For example, it says that the RTA will conduct that study to investigate in-cabin exposure to pollutants in the tunnel under congested conditions. I suspect this study is the same one you spoke about, so is the RTA involved in the study; is it your study, is it their study; who designs it?

Dr SHEPPEARD: It is our study. The RTA has funded the study, but it has been designed by the staff of the South East Sydney Public Health Unit in consultation with people from the Environmental Health Branch. The RTA has reviewed the study protocol, it has been advised generally when it is happening so that the tunnel operators can be aware in case there are any difficulties in using the tunnel, but it has had no detailed input into the study.

The Hon. JOHN RYAN: One of the reasons I ask is that the description of the study we were given seemed to give the impression that you were studying in-cabin conditions in motor vehicles. Are there not other areas of exposure within the tunnel that might be of concern to you, for example RTA staff working within the tunnel, a motorist standing beside a vehicle waiting to be rescued, a motor cyclist, a person driving an open vehicle? Are they not relevant groups of people to study?

Dr STEWART: Perhaps Dr Sheppeard might talk about the scenarios. That would help with this question.

Dr SHEPPEARD: As Dr Stewart mentioned, we are studying three different scenarios in the study. We are measuring vehicles with the vents and windows closed, vehicles with the windows closed but the vents open and then vehicles with the window down, and we believe that the vehicles with the window down would be similar to a motor cyclist, so there is basically no barrier to the air exchanges in the third scenario. You mentioned occupational exposure. That is a matter for the RTA.

The Hon. JOHN RYAN: The public can be exposed in the same manner if you are standing next to your vehicle you are in the same position as an RTA person going in to rescue someone are you not?

Dr SHEPPEARD: That is a problem, an exceptional circumstance but it probably would not be warranted to do a study.

The Hon. JOHN RYAN: Some people would regard the level of pollution in the tunnel as exceptional?

Dr STEWART: The point is that one of those scenarios is equivalent to an open-exposure scenario.

The Hon. JOHN RYAN: In terms of time an open vehicle going through the tunnel in seven minutes is not anything like standing next to your vehicle for fifteen to thirty minutes as has occurred.

Dr STEWART: We will know about exposures in the tunnel in those three scenarios. We will be able to extrapolate from that. I emphasise though we are talking about the general public and general public exposure. Issues about the occupational health and safety of RTA employees are for RTA to deal with not health. We can provide advice about health effects and so on.

The Hon. JOHN RYAN: I do not understand why the department health would not be just as concerned about a person standing in the tunnel as opposed to a person going through the tunnel on his own, whether they were working for the RTA or standing next to their vehicle. There have been a couple of incidents recorded -- who knows how many non-recorded -- where people have been standing in the tunnel for ten to fifteen minutes, up to one and a half hours. Surely in any study that looked at exposure to particulates in the tunnel it would be relevant to study someone in those circumstances as well.

Dr CORBETT: There are two things I would say to that. I think it is a simple matter of extrapolating exposures in the open ventilation situation to the time you or others may be concerned about. We could do that that is not a difficulty. Secondly, as far as occupational health and safety, this is a matter for the RTA but as with all respiratory hazards there is the option of using personal respiratory protection for people who are exposed in the workplace. That is a risk-management option, which I am sure is part of the suite of things that will need to be considered.

Dr STEWART: The third important point is, as the Committee is aware, in circumstances where there are exceedances, of which there have been eight that we are aware of, the ventilation in the tunnel –

CHAIR: You are talking about CO?

Dr STEWART: Yes but we say, and perhaps I did not make it clear, that we think that carbon monoxide is the best marker for exposures. When those exceedances occurred, the ventilation changes - and the study we are doing about ordinary use of the tunnel is different to the one Mr Ryan is suggesting.

CHAIR: Would you recommend motorists using that tunnel carry facemasks in case they breakdown?

Dr STEWART: No we do not recommend anything at the moment. We are doing this study to find out more things. We do recommend prudent avoidance, it is an ordinary principle applied across a range of environmental areas. We do say you should wind your windows up. We are surprised people do not wind their windows up; we are surprised people do not turn their engines off when they have stopped.

The Hon. JOHN RYAN: There might be lots of reasons why people do not wind their windows up, if it is a very hot day and you do not have air-conditioning, there would be plenty of people who would blaze

through the tunnels unconcerned. I am amazed at what appears to be the fairly low level of concern of NSW Health.

Dr STEWART: The Department does not have a low level of concern. Mr Chair, I have to go to the Government Monitoring Committee for the Medically Supervised Injecting Centre, a meeting I cannot miss, it started at 1.00 p.m. Would it be possible for us to be excused now?

CHAIR: Yes.

The Hon. JOHN RYAN: On the condition you are prepared to answer questions on notice, the Opposition has had five minutes of questions.

Dr STEWART: We are happy to answer questions on notice.

(The witnesses withdrew)

(Luncheon adjournment)

KERRY THERESA HOLMES, Air Quality Scientist, Environmental Chemist, Holmes Air Sciences, Suite 2B, 14 Glen Street, Eastwood, sworn and examined:

CHAIR: Are you conversant with the terms of reference of this inquiry?

Dr HOLMES: Yes, I am.

CHAIR: If you should consider at any stage during your evidence that in the public interest certain evidence or documents you may wish to present should be heard or seen only by the Committee, the Committee will consider your request but it may be overturned by a vote of the Legislative Council.

Dr HOLMES: I have been involved with the project for some time, since the early 90s. We did the first environmental assessment on the ventilation stack. We have had a long-term involvement and I am now part of the air quality group that was set up to look at air quality issues. One of the important parts of environmental assessment is to really see if what you predicted turns out to be reality. Our firm is extremely interested in looking at the monitoring data that has been collected, so it is clearly post-operation of the tunnel, to see if the predicted levels in our assessment, and in assessments done by other consultants, they were subcontracted out, did in fact eventuate. I have made a submission which summarises the study that we have done quite recently and I would just like to go through some key findings of that and bring out what we found.

The questions that we asked in that study were: Have the maximum short term concentrations of any of the monitored emissions changed significantly since the tunnel opened and have the long-term average concentrations changed? We also focused on periods when the wind was blowing from the ventilation stack to the monitoring sites to see whether it was possible to detect the presence of emissions from the ventilation stack above the existing concentrations. We did this to increase the sensitivity of our studies.

The next slide shows the location of the monitoring stations. There are five of them in all. Three of them were commissioned in June 2000 and the other two just prior to the opening of the stack. Today I am going to focus on results from U1 and T1, which were the two that were commissioned prior to opening, because what we have done is compare the values before opening and the values after opening of the tunnel. Unfortunately, at this stage we do not have a full year of data to analyse, but this is an ongoing project and when we have that year we will analyse that as well. What we have got is seven months of data from December 2000 to July 2001 and from December 2001, when the tunnel was opened, to July 2002 and we are presenting a comparison of that data.

The reason I put this overhead up is just to make a note of the location of U1 and T1, and I want to discuss a little bit the wind data that we collected at these sites. There has been some discussion on whether there is any meteorological information in wind data that is representative of the top of the stack, and in fact the site U1, which is on the ridge of Jackson Place, has installed in it a 20 metre mast, rather than the standard 10 metre mast. This was done specifically following consultation with the EPA and community groups to try and get some wind measurements close to the top of the valley, and also, as it turns out, close to the top of the stack. So you have got a 20 metre mast with the wind monitor on top of that, sitting on a ridge that is 10 to 15 metres above sea level, and the stack itself is in the base of the valley, so that is a total of 35 metres, so that wind data should be reasonably representative of the wind at the top of the stack. The data that was collected at T1, which is on the floor of the valley, is from a 10 metre mast, and so it is 10 metres above sea level or thereabouts. That is more representative of winds within the valley.

The next overhead shows the correlation between wind data that was collected at U1, which is the wind direction down the bottom, and T1 is on the vertical access, and this is five minute data, so it is quite good time resolution. What I want you to see is that there is pretty good correlation between most of the directions at U1 and T1, except if you look at the top of the graph you will see that wind direction at T1 at about 270 degrees has a series of points where you can virtually have any wind direction for U1, the monitor on the ridge. So there are winds at T1, which we have interpreted as valley winds, which are picked up by T1 which you do not see at U1.

The next overhead is a three dimensional representation of the same data, and you can see on the right-hand side again that line going down from 270 degrees. We have now got the wind direction at T1 down the bottom, and that 270 degree line, which is the valley wind, is now vertical. On the right-hand access we have the speed, and if you

follow that vertical line out to the speed, you will see that the winds are about one metre per second. These are low speed winds and they are consistent with winds in the valley. So there is a difference between what U1 and T1 are measuring in terms of wind.

The next slide shows a correlation between the meteorological data collected at the community based monitoring station, which is actually at a high point at an elevation of about 40 metres with a 10 metre mast, and again there is quite a good correlation between the wind direction at U1 at Jackson Place and the wind direction at the community based monitoring station.

If we compare, on the next slide, the wind direction at the community based monitoring station with the wind direction at T1, the one in the valley, we will see again this valley wind at 270 degrees. So the community based monitoring station, which is elevated, and the U1 monitoring station, which is also half way up the ridge but has a 20 metre mast, those appear to be measuring winds that are above the valley or close to the top of the valley, whereas T1, which is in the valley, is picking up the valley winds. So I think we have got, with this data set from four monitoring stations, quite a reasonable representation of winds in the area which will allow us to interpret some of the monitoring data on the basis of wind direction.

The next slide is just a summary table, which I am sure people at the back will not be able to read, but it is contained in our submission. It is a summary of the monitoring data for the two sites, T1 and U1, before and after the motorway opened. Basically, it shows that long-term averages tend to be up a bit for NO2 and down for the other pollutants, and if we look at the maximum concentration for the pollutants, this will jump around a bit, mostly they are down, sometimes they are up.

Long-term averages are quite a good way of looking at long-term overall effects, but just looking at the maximum concentration, it is a fairly poor tool for looking at changes, because you can have one particular event which skews your results. So what we have done is this analysis using pollution roses, and Dr Manins put some up this morning, and we have done a similar sort of analysis.

If you have a look at the next slide, this is the comparison of the average NOx concentrations at U1 for different wind directions. We call this the pollution rose. You see down the bottom left-hand side of the pollution rose there is a direction which shows you the winds you would need to get from the stack to the monitor. The red dots are the emissions after the tunnel opened and the plotted lines are emissions before. You can see that there are some reasonably high levels of NOx, or higher levels of NOx, that appear to be coming from the north west before the tunnel opened which are not there once the tunnel was opened.

The next slide shows the NO2 results and the NO2 levels are a little bit higher after the tunnel was opened, but you have to be very careful in interpreting NO2 data because NO2 is not a primary emission from the tunnel. Most of what comes out of the tunnel is nitric oxide, which means it is subsequently oxidised to nitrogen oxide in the presence of sunlight and ozone. So interpreting this nitrogen dioxide data is quite complicated and we have to be a little bit wary about doing that, particularly in terms of interpreting wind direction and nitrogen dioxide, because it can take a while for the nitric oxide to convert to nitrogen dioxide.

The next slide shows a similar sort of plot for CO and here the levels look similar. This, again, was for site U1. I think what is notable is that there does not appear, as Dr Manins showed, to be any sort of significant change, if you like, in direction that would carry the pollutants from the stack to the monitors.

The next slide shows the annual average PM10 concentrations at U1. Again, there appear to be some levels from the east which were present before the tunnel opened but are not present after the tunnel opened, and we do not know what the source of that pollution is. It may be from other sources in the area, perhaps construction activity that disappeared once the tunnel opened. The next slide shows a similar long-term average plot for PM10 at T1, and again you can see that from the east there are high levels of pollution before the tunnel opened.

The next slide shows now a comparison of short term averages, and the data that we have is 15 minute data, so it has got quite good time resolutions, and here we have compared the top four measured levels, the top four 15 minute average PM10 concentrations at T1, before and after the tunnel opened. The next slide shows the NOx concentrations, and what you can see there is a bit of a shrinking of the pollution roses after the tunnel has opened.

The next slide is the PM10 concentrations at T1. Again, you have got 15 minute averages, and these are the top four, and there is not a very marked change in those.

Our conclusions from this study, and there is a lot more information in the study but I have really just pulled out some of the more significant features, is that, firstly, when the effects of bushfires are removed from the Earlwood EPA data which we used as the reference data set, the air quality was similar in the period December to April. We have only that data. It was similar in the period December 2000 to April 2001 compared to December 2001 to April 2002. We used this data set as a reference data set of data that was collected in similar sorts of environments that are unlikely to be affected by the stack.

Since the tunnel opened there has been a reduction in the total NOx concentrations in winds from the north west. We suspect that that may be due to lower truck traffic on surface roads, but again that is speculation rather than any proven fact. Other pollutant levels have not changed so significantly. The measured concentrations at the monitoring sites do not give us any indication - we cannot pick up any really significant signals from the ventilation stack. It is similar to what Dr Peter Manins showed this morning, that with the monitoring data we are collecting, we are unable to pick up any strong signal from the ventilation stack.

A further point I wanted to make is the fact that we focused on the major emissions from the tunnel, certainly in terms of mass, and we have not found any easily detectable changes due to the tunnel opening. One of the major impediments in detecting emissions from the ventilation stack is that there seems to be emissions from other pollutants that are in the area, in that a large contribution to the air quality is from motor vehicle emissions. We do not have any particular marker compounds that we can readily use to identify emissions from the stack. So these changes that we are trying to detect are against a background of emissions from other roadway sources and also against a varying background that is going to be influenced by meteorology.

It has been suggested that we should perhaps be focusing on other emissions such as benzene or ultra-fine particles but, in my opinion, we have the same sort of problems with these as well. They are more minor components of the emissions and, again, they will be against the background of contributions from other roadway sources, so I believe we will have the same sort of difficulty in picking them up against this background.

CHAIR: Have you been asked to look at the in-tunnel problem which is now looming rather large?

Dr HOLMES: Not really. Ventilation design of the tunnel is outside my area of expertise. My part in this project has been to look at what happens to the emissions once they get out of the vent and to look at the ambient air quality effects. Having said that, I have had a look at some of the data from within the tunnel because what is of interest to me particularly is whether the emissions in the tunnel are as predicted in terms of the total emissions that come out of the stack, so I have looked at it in that context. I have listened to the arguments and I am quite aware of the issues. I have not been asked to attempt to solve the problem in any way or contribute in that sense as I am not a ventilation expert.

CHAIR: You would now be aware that there is an emerging standard for PM2.5?

Dr HOLMES: Yes, I am.

CHAIR: Do you have or have you seen any of the readings from the GRIMM station which is measuring PM2.5?

Dr HOLMES: Yes, I have. I was involved in the early stages of consultation with the community and with the EPA on setting up this monitoring station, providing some scientific input into it, and what I thought would be useful to measure, not necessarily in terms of compliance testing but certainly in terms of things that might be, at least to me, scientifically interesting. We have been using GRIMM monitors ourselves in our firm and we were quite interested to use these to get some scientific information. We suggested that a GRIMM be installed along with the TEOM and the high volume sampler because the GRIMM has the capability of simultaneously measuring the PM10 and PM2.5 and we thought it would be a useful adjunct to this data that was being collected, but would never be used in that sense for compliance testing because the GRIMM itself is not an instrument that is recommended for use for measuring PM2.5. It uses light scattering to measure particulates and so it has to again be calibrated against some

method, but it has useful information in the sense that it allows you to determine some relativity between PM2.5 and PM10.

We are involved in analysing this data, analysing monitoring data, as part of a project with Dr Peter Best and RAPS and we asked that Baulderstone provide us with all the information that was available, so we got it in a package and we were certainly aware we had that data. We have not done any analysis on it for this study for the reasons I have just said: It is not an instrument that is used for compliance testing and will not be used for compliance testing for PM2.5, but what we have got out of it so far is that, on average, about 65 percent of the PM10, according to the GRIMM measure, at the moment is PM2.5.

CHAIR: 65 percent?

Dr HOLMES: Yes, that is on average.

CHAIR: Do you know how that would compare with ordinary ambient air?

Dr HOLMES: It is in the same order. It varies, but it is in the same order. It might be a bit higher on average.

CHAIR: It is about 38 percent in ambient air normally, is it not?

Dr HOLMES: Well, it ranges. It is about 40 percent, but it ranges from 30 to 80 percent, depending on what the sources of the particulates are, and if you have a lot of woodfire smoke then it can be quite high, so in winter it can be quite high when you have those sources. In summer it can be lower because you have more particulates from, say, dust storms.

CHAIR: Are you aware of the evidence given by Baulderstone Hornibrook this morning about the conversion of a visibility factor into micrograms per cubic metre?

Dr HOLMES: I actually did not hear the evidence, but I am aware that they gave it and I am also aware that there is a conversion factor from the light scattering technique to the mass technique.

CHAIR: That is the GRIMM, is it?

Dr HOLMES: Well, the GRIMM is a different instrument, but it is the same principle or a similar principle and it would have to have a similar conversion factor.

CHAIR: They were saying that a .005 visibility factor would convert to 1000 micrograms per cubic metre. Are you familiar with that?

Dr HOLMES: I would have to check the number, but I know that there is a conversion factor of that order. I would have to check whether that figure was right or not. I believe those conversion factors are reasonable given that what you are looking at is fairly well defined emissions. If you were to use it in the ambient air where there is a whole different mix of particles I think you may get different numbers, but if you are using it in a relatively controlled environment where the emissions are from a constant source pretty much I think you can use those conversion factors.

CHAIR: I have talked to a number of residents and we have had submissions from a large number of residents and have been to one or two of their homes and it seems to be clear to me that the instance of sickness that they suffer occurs when the wind is blowing in the direction from the tunnel, so if it is not PM10s, could it be other things like naphthalene, toluene, fluorene, benzene or formaldehyde?

Dr HOLMES: Well, all of those pollutants will be carried and dispersed in the same way as the PM10s. As you know, there have not been any measurements made within the tunnel of those pollutants, but there have been measurements made in the harbour tunnel by CSIRO in the early days of a whole range of organic compounds and the National Pollutant Inventory actually provides emission factors for motor vehicles, both diesel and petrol vehicles, so we could estimate what the benzene emissions were from that tunnel, not precisely, but we could make a

reasonable estimate based on the traffic that is in the tunnel. For example, typically, the total volatile organics are about 10 percent of the carbon monoxide levels and typically benzene is about 5 percent of the total volatile organic compound, so based on that we could make a reasonable estimate of what is in the tunnel in terms of concentration if we know the carbon monoxide and also what is coming out of the stack if we know the carbon monoxide emissions.

CHAIR: Would you have an opinion whether it would be worthwhile measuring outside the tunnel on the monitoring stations other than PM10s and various other substances - toluene, fluorene and so on - as well as inside the tunnel, because if it is caused by something other than PM10s we should be able to pinpoint that somehow or other, should we not?

Dr HOLMES: It is what I alluded to earlier: I think it is quite difficult. Scientifically, I am quite interested in having these measurements done and I know that some measurements are going to be done within the tunnel when odour is measured, there will be some speciation of the odour to look at the different organic compounds there, so we will get some handle on it, but right now, as I said, we could make an estimate of what the levels were and they would not be precise but they would certainly be in the right ballpark, I am sure of that.

In terms of measuring at the residences, in terms of short-term measurements, I think they will be quite difficult because we are looking at very small concentrations. If you say carbon monoxide, 10 percent of that, and then 5 percent of that for benzene, you are looking at low levels and the instrumentation to get time resolved measurements for that sort of level is really, to my understanding, not there and you need to take long-term measurements. So taking short-term measurements or trying to get time resolved measurements for these specific toxics is quite hard in that situation, and to measure it against a background of existing air toxics, which will be there from a variety of sources but including motor vehicles and wood smoke, I think is more challenging. I think it would be extremely difficult. I think if odours are being detected there, and that is what was reported, that the reality is the human nose is still the most sensitive way of measuring odour and detecting very small quantities of these sort of compounds. I think it would be hard to do that. I am not saying it should not be done, but I think it would be very difficult to detect, just as we are finding it difficult to detect these small quantities.

The Hon. MALCOLM JONES: Dr Holmes, in your graphic presentation to us, it seems to assume, please correct me if I am wrong, but generally that varying winds are from the north east, east and south east. Is that correct?

Dr HOLMES: Yes, I think that is reasonable.

The Hon. MALCOLM JONES: And the roses which you have demonstrated are U1 and T1?

Dr HOLMES: Yes.

The Hon. MALCOLM JONES: Looking at the map, it appears to me, and as I said please correct me if I am wrong, that both U1 and T1 would be in a position where generally there would be monitoring of the air moving in the wind before they get to the stack, because they are both to the east of the stack.

Dr HOLMES: One is to the north and the other is to the - yes, you are right.

The Hon. MALCOLM JONES: So in the exercise that you demonstrated to us, they are actually damming in the air before it has reached the major source of pollution?

Dr HOLMES: On some occasions but not on all occasions. On the occasions where the wind is blowing from the south and from the west you will get -

The Hon. MALCOLM JONES: If the general prevailing wind is coming from a direction which is from the same area where the monitoring stations are, would that not be counter-productive or would it not be better to perhaps take T3 and T1, one either side?

Dr HOLMES: T3 is a monitoring station which only has air toxics measured at it. So that is measured on a 24 hour basis. So we do not have the sort of time result data that we have here. What we have here is an opportunity to examine the air quality levels before and after the stack commenced operation. We do not have that opportunity

with any of the other monitoring sites. However, I would say that we have actually looked at a correlation between the monitoring that was carried out at X1, which is the other station on the ridge, and U1, which is to the north of the stack, and X1 is to the west of the stack, and we have got a very good correlation between the one hour PM10 data at those sites.

The Hon. MALCOLM JONES: In the presentation that you have submitted today, would it not be better to look at a comparison between X1 and T1?

Dr HOLMES: We can look at a comparison between those two and we would --

The Hon. MALCOLM JONES: Do you understand the point I am making?

Dr HOLMES: Yes, I understand what you are saying, what is upwind and downwind of it, but the point I made is that there is a very good correlation between the two sites on the ridge.

The Hon. MALCOLM JONES: Am I right in thinking, based solely on the submission which you have presented today, that with the installation of the tunnel, the changes to the traffic and the building of the stack, it would appear to have actually had a beneficial effect on the air quality in the region outlined by your map, is that correct?

Dr HOLMES: Yes, I think you would have to be careful of interpreting it that way, but on the basis of that information it appears to be so, yes.

The Hon. MALCOLM JONES: Yes, based solely on that information.

The Hon. JOHN RYAN: Can I just go to a couple of comments about your results. If I may take what my colleague has just said and put it to you in more lay terms, there will be some people in the community who would say that the two sites that you have chosen to study for the purposes of the survey have been the two sites the least most likely to have been impacted by the stack, and therefore you have basically compared two sites where there would not have been an enormous level of change, with or without the stack, and I guess what would make life interesting for them is what actually happens to the people who are more likely to be impacted by the stack. Do you understand how the argument will run in simple terms?

Dr HOLMES: I understand that.

The Hon. JOHN RYAN: How do you respond? In one of your responses you said that there was a high level of correlation. I am not quite sure how you can correlate some results when you have got nothing to compare with?

Dr HOLMES: No, the correlation is between the monitoring of the results after the stack was operating, because you are quite right, there is no data from before the stack was operating.

The Hon. JOHN RYAN: So how do you correlate the two? Does it mean that the results are the same?

Dr HOLMES: You correlate X1 PM10 data after the stack is operating with the U1 PM10 data after the stack is operating. So we can do that and we have done that.

The Hon. JOHN RYAN: One of the significant results which I must say has been latched onto by the tunnel operators and the RTA and other people who have made submissions to the Committee in defence of the stack has been your findings in regard to nitrogen oxide, the NOx X values, which show a decrease of 12.7 percent during the period studied at these sites over the two periods studied. Is that a sufficiently statistical difference to say comprehensively that that represents a significant change, or could it be? I do not understand what is a significant change. It seems to me to look significant but I suspect it might be more complicated.

Dr HOLMES: Yes, it is more complicated than that. It is has a high standard deviation, so in terms of statistics it would not stack up. It is an observation and you are looking at data which is highly variable and you see the trends and see whether it has gone down, and that is all I would want to say about it. If it is a consistent trend and

it keeps showing up in all the data, then I think after one or two years you could be more confident of that.

The Hon. JOHN RYAN: What would be a reasonable value for the standard deviation that you have measured, the significance of that?

Dr HOLMES: It would have to be lesser than the mean value.

The Hon. JOHN RYAN: I am sorry?

Dr HOLMES: You would want it to be less than the mean value.

The Hon. JOHN RYAN: Perhaps this might be worthwhile for people who do not necessarily understand maths. What would the value of the mean be and what would you compare it with?

Dr HOLMES: The mean value, if we look at the NOx data, the mean value, let us say, at T1 before the tunnel operating was 85.2 micrograms per cubic metre and the standard deviation was 109.7. So the standard deviation is greater than the mean.

The Hon. JOHN RYAN: The final issue I wanted to explore with you is I am looking at a facsimile that you sent to Steve Isles, which explains the impact of something called a "plume effect", and if I may read the relevant paragraph:

> The plume width will be in the first instance determined by the diameter of the stack but once released into the atmosphere, plume width will be governed by prevailing dispersion conditions. Under good dispersion conditions the plume will widen rapidly, however the plume has the potential to remain narrow for long distances under poor dispersion conditions, that is, a stable atmosphere often referred to as an inversion which can occur at night, particularly in winter.
>
> It is true that under these conditions the plume will make the greatest impacts if it interacts with elevated terrain and the results of all the modelling carried out to date for the project indicates this. The highest model predictions generally occur under these circumstances.

What that paragraph seems to explain to me is that the plume effect is something that is likely to happen more in winter than in summer and the results that you have given us are summer results, not winter ones. So is that a significant factor that might show up in the next lot of measuring data from April to December? Secondly, could you explain to the Committee, if more detail is required, what this plume impact is and is that something which is likely to affect the 400 people who live close to the stack on the ridge?

Dr HOLMES: In answer to your first question, the data that was analysed before and after the tunnel opened, the U1 and T1 data, were actually from December to July, so it did include winter months. The EPA data is up to April, but the tunnel data or the tunnel monitors were up to July. So it does include winter.

The second question about plume, the plume is the modelling term which is used to describe the emission from the stack, and the way the plume behaves, the way it dilutes, is all part of what we assess when we do the dispersion modelling. So the description that I have there is the way the model works, the way the model interprets that information, and generally it is true that if you have elevated terrain the conditions under which you get the maximum levels from the emissions from the stack are stable atmospheric conditions or dispersions.

If the plume did not interact with the terrain, then you would have zero predictions at that point, and we are not getting zero predictions, so our interpretation is that this is exactly what is happening, that under those conditions you get the maximum concentration, and it is on the ridge where we predicted it, and that is why the monitors are there, or one of the reasons the monitors are there.

The Hon. JOHN RYAN: Is it fair to say that there might well be, with time, elevated levels of pollutants for people living on the ridge arising from the stack?

Dr HOLMES: I believe that that will be the time when the maximum concentrations occur. That makes sense. That is the time that everyone is predicting it will occur.

The Hon. AMANDA FAZIO: We heard some evidence on Friday from Dr Best, who also does air quality measurements, about potential causes for changes to air quality since the tunnel has opened, and he mentioned the change to Sydney fuel specifications that came in in January 2002, when some manganese based substance called MNT was added to lead replacement petrol. Have you got any comments on that, whether you think that would be contributing in any way or whether that is just a side issue that has an impact?

Dr HOLMES: I think it is unlikely. I have not looked at that aspect myself, but I know it is something which was widely used in Canada, and I know just from a brief reading that some of the effects that people are describing are not inconsistent with the respiratory effects that the compounds in petrol would have, but I do not know what the concentration is in petrol. I think it is unlikely. That is my professional opinion, but it is not based on any measurements that I have made or any, I guess, real assessment data.

The Hon. AMANDA FAZIO: The other thing that Dr Best raised that he did not seem to have an answer for, but he raised it as an issue which he thought could be having an impact on the way that the plume effect is operating, is that the stack temperature is eight to ten degrees Celsius above the ambient temperature, and he said that, as far as he could work out, was not anticipated when the tunnel was being designed and put in place. Have you got any thoughts on that matter?

Dr HOLMES: When we did our first modelling, we thought that the temperature was likely to be higher than ambient, just because of all the hot engines in the tunnel and the hot exhaust emissions. We did our modelling assuming that it was at ambient values, and I know that Air Noise Environment did the same thing.

CHAIR: What was that word you used?

Dr HOLMES: Air Noise Environment. They were the consultants that Hyder used to do the modelling, and we all did the modelling in that way just to provide a conservative assessment, because we did not know what the temperature differential would be. We thought it would be more than zero, but whether it was two, whether it was five, we probably did not expect it to be eight, but again what we did was likely to cause an over-prediction rather than an under-prediction, and I think everyone is agreed on that.

The Hon. AMANDA FAZIO: We had evidence from another fellow on Friday called Noel Child.

Dr HOLMES: Yes, I did not hear Mr Child's evidence.

The Hon. AMANDA FAZIO: He made the comment that he believed there was no demonstration yet that there has been an increase in outside particulate matter because of the tunnel. I just wondered if you had any comments on that view?

Dr HOLMES: I think our analysis of the data confirms that and it is contained in our submission and what I presented today.

(The witness withdrew)

(Short adjournment)

CHARLES BRIERS, President, Residents Against Polluting Stacks, PO Box 270, Earlwood;

MARK CURRAN, Member, Residents Against Polluting Stacks, 38 Hocking Avenue, Earlwood;

GISELLE MAWER, Member, Residents Against Polluting Stacks, PO Box 270, Earlwood;

JUDITH MAY ROSSI, Member, Residents Against Polluting Stacks, 3 David Street, Earlwood, sworn and examined, and

PETER SIAPOS, Member, Residents Against Polluting Stacks, 158 Bayview Avenue, Earlwood, affirmed and examined:

CHAIR: Are you conversant with the terms of reference of this inquiry?

Mr BRIERS: I am.

Mr CURRAN: I am.

Ms MAWER: Yes, I am.

Mr SIAPOS: Yes, I am.

Ms ROSSI: I am.

CHAIR: If you should consider at any stage during your evidence that, in the public interest, certain evidence or documents that you may wish to present should be heard or seen only by the Committee, the Committee will consider your request, but it may be overturned by vote of the Legislative Council. Do you wish to make an opening statement?

Mr BRIERS: Thank you for the opportunity to address this third and hopefully last inquiry into the M5 East ventilation stack. I say "hopefully" because it is now patently obvious that many of the key findings of (a) the Child Report for Canterbury Council; (b) the first Upper House inquiry; (c) the International Tunnels Conference and (d) the second Upper House inquiry have been confirmed as being absolutely correct and that the corrective action needed to satisfy the real concerns of the public will now be acknowledged.

The key findings I refer to are health effects, environmental impacts and financial impacts of the stack on tunnel users and communities living and working within the immediate environs of the M5 East exhaust stack. These problems are real problems demanding immediate resolution. They are not figments of the imagination or subjective allegations, as was suggested at the recent Budget Review Committee Meeting.

It is worth restating that we are dealing with a project whose concept was laid down in the early 1990s, a concept that, when realised in the year 2002, is carrying year 2010-plus traffic volumes with all the concomitant problems, a project which has exceeded design expectations in terms of the ventilation system being not able to cope with the higher than expected number of vehicles using the tunnel daily.

With your approval, Mr Chairman, and based on the assumption that all members have read our submissions, I propose that our addresses be kept down to 30 to 40 minutes and that will allow one hour for questions and answers. Our first speaker will be Judi Rossi. Judi will address you on matters of health and process. Our second speaker will be Mark Curran. Mark is a member of the Air Quality Community Liaison Group and a member of the TEOM Correction Factor Select Committee. Mark will be addressing technical and scientific matters that need to be scrutinised and need to be better explained in the public forum. Our final speaker will be Giselle Mawer who will address issues related to the evidence provided by the four departments we have heard at the inquiry and also address property value issues. Mr Chairman, it would be appreciated if questions are held until the completion of our addresses.

CHAIR: That is no problem.

Ms ROSSI: RAPS has made a detailed written submission to the inquiry, so I do not intend to go over that, but what I would like to raise and highlight is a number of key points to do with health impacts on local residents and also the complaints procedure.

It is clear from the evidence presented already to this inquiry, including that given by residents under oath, that new and exacerbated health effects have been experienced in the area local to the stack since the M5 East began operating in December 2001. These complaints, as you have already been told, range from itchy eyes and sore throats to frequent headaches, breathing difficulties and skin rashes. Some residents have actually complained of quite serious health impacts that they have not had previously. For others it seems to be just ongoing complaints. They might not seem terribly serious complaints, but they are ongoing, they are occurring frequently and they are really causing distress.

The Roads and Traffic Authority, the EPA, Planning NSW and the Health Department were all receiving complaints of health impacts as early as January and February of this year. Despite approval condition 73/5, which was established in August 2000 stating that the RTA shall establish a mechanism regarding the potential for complaints about air quality impacts resulting from the stack, there was no advertised complaints procedure once the road opened. It meant that in the December-January-February period residents did not know who to ring. They just knew that they were getting headaches perhaps that they had not had previously or that they had skin rashes that they had not had previously. Some rang the local councils to complain, whether it was Rockdale Council or Canterbury. That happened to me actually and I was told to ring the EPA. When I rang the EPA they said, no, they were not the regulatory authority, and I was to ring the RTA. I rang the RTA traffic line and found that no one there knew anything about the M5 East stack or anything about complaints. I persisted and asked that they note something down and that that be forwarded to someone who could do something about it.

In March, in a meeting between representatives of RAPS and senior officers of the RTA, the RTA officers were alerted to the distress being suffered by residents. A couple of us in that meeting were able to talk of impacts on our own families, so we were able to give them details of what had been happening. They said all the right words about being concerned, but they also were able to tell us that no, there was no complaints procedure at that time, they were certainly thinking about it and it was going to be advertised soon, and there was no procedure whereby any complaints received were being forwarded on to the Health Department. Under the approval conditions, all they were required to do was advertise a complaints procedure basically, not necessarily do anything more with it. That was their interpretation.

As a result of that meeting, we actually invited the RTA to send a representative along to the next RAPS meeting. It was to be a public meeting and it was to be on 16 April. The RTA officer agreed that, yes, she would do her best to have someone along to that meeting, and so we went ahead and 3,000 leaflets were distributed in the local area. 12 hours before the meeting the RTA pulled out and there was no explanation given. Over 200 people attended that public meeting and over 70 complaints were actually noted and then those were forwarded to the different Government departments, that is Health, Planning, the RTA and the EPA.

In May, six months now after the stack had been operating, finally an advertisement appeared in the local paper. I can table that advertisement. Interestingly, it did not even mention the word "complaint"; it did not even mention the M5 East stack. I have that here. I also have the copy of the approval conditions for August 2000, but I assumed you would already have those.

CHAIR: Yes.

(Moved by The Hon. Amanda Fazio: that advertisement by the RTA be tabled; agreed)

So we finally had a complaints line. RAPS requested a meeting with the Department of Planning at this stage. We were told we were to go to the RTA. So all the time, any complaints go back to the RTA, they will deal with them. They did start to deal with them. The phone line that was set up was the 8814 2580 line that was advertised in the local papers. If you rang on the weekends, when a lot of people actually were at home, there was no answer, there was no-one on that line. If you persisted and rang the traffic management line, the 131700 line, you were lucky if, after

you went through two menus and sometimes two or three different people, you were able to log a complaint.

They were very pleasant generally, but they really did not know much about what was happening and they would say, "This is not my responsibility I will find someone who can look after this", and I went from speaking with Scott, to speaking to Louise and speaking to a whole number of people. Finally, I would find someone who would say, "Okay, I will log the complaint". I would then ask that someone from within the RTA would ring me back. There would be a promise that they would. Often times they would not, and then I would have two or three calls during the week to try and find out, okay, has someone logged down that my daughter and I were not able to stand near the kitchen window on the weekend without reacting, because we found we were getting mucus in our throats or one of us was actually wheezing, and, finally, these complaints are starting to be logged. Unfortunately, not much seemed to be done with them.

We had residents from the local area saying that when they tried ringing the complaints line, some officers had even suggested that the smoke would be from the Blue Mountains. Sometimes it was. Sometimes the winds would be from the south east, and I doubt that the smoke would be coming from the Blue Mountains when the wind is from the south east. Sometimes it was the airport, stress, flu injections or hormonal factors. Sometimes the wind was just from the wrong direction.

I live on the ridge above the valley. What I am aware of is that a lot of the winds that come in from the south east, and I am on the north western side of the valley, the winds from the south east will bring any emissions across from the stack if they are not being dispersed, if the wind speed is not strong enough. I am aware that some of those emissions actually pool in the area to the north west of the valley. You can actually smell them. You can go down a walkway from the ridge top, you wind your way down the valley slope, and as you go through different levels down that slope, you actually go through a layer of fumes.

The odours and health impacts were occurring with such frequency that it became tedious to have to constantly track through two and three phone numbers of people before you could have the complaint logged, and then you often found the person was trying to dismiss it. People lead busy lives; when they are already unwell, having to track through the complaints procedure just seemed nothing short of futile. Many people have told us they have just given up.

Documents released through parliamentary resolution actually show some of the comments and the lobbying of the complaints. I have here an e-mail that I will also table. The original message is from Janet Angel who was with the RTA. She was often the woman who was on the complaints line during the week. She has put together an analysis. Her analysis says that "there have been 67 complaints to date with sufficient information for some analysis".

Interestingly, she was able to analyse while we were on the other end of the phone; without actually being in the area, she was able to determine that the complaint could not possibly have been related to the stack because perhaps the wind was not from the south or south east. I am aware that some of the pollution pools in the north western part of the valley and when you get a wind change you could very well be getting those fumes later on, even though the reading on the web site for the RTA shows you a different wind direction.

Interestingly, if only one person had complained at the same time, then it could not have possibly been from the stack. This was about the depth of the analysis that was being carried out. People were ringing up to complain, they wanted the complaint logged. If it may have been due to the stack - sometimes it would not have been due to the stack - we just wanted the complaint logged and the details logged, so that someone could come in and honestly assess the situation. It was not happening.

This e-mail then was from Janet Angel to Jay Stricker at the RTA. From Jay it is going to Vicky Sheppeard at the Health Department. So finally there is actually a process that takes you from the residents to the RTA to the Health Department. Out of the total of 67 complaints only 21 ended up going through as being possibly from the stack.

Given that our concern about air quality dominated four years of the community's concerns about the M5 East, we find it quite incredible that the motorway opened without a complaints line and without the involvement of New South Wales Health in a monitoring program. It is even more incredible that nearly 12 months after the motorway

opened there is still no effective complaints line. Residents are reporting illness; there is no independent local monitoring of PM10s as required by condition 73/5 and New South Wales Health is yet to begin an investigation. We believe they intend to do so, but it still has not happened, and some residents have now been sick for close to 12 months on and off.

Residents are in a unique position to see what is going on with regards to the interactions between the Government departments because we have actually had access to the documents through parliamentary resolution. What we have appreciated is the officers who have made an attempt to have residents' concerns investigated and the Members of Parliament who have acknowledged the very real issue in terms of process, health and safety that the M5 East represents.

Please, I appeal to you can we have an honest appraisal of the evidence before you. I support Charles Briers and other members of RAPS in asking for a bipartisan approach, in asking that the members of the Committee consider all the evidence in an open way so that we can get onto the business of finding solutions. Thank you.

Mr CURRAN: I know to some of you it is a puzzle as to why we are still here. Most people would have given up long ago and tried to make the best of a bad thing and, besides, perhaps things were not as bad as they thought they were at first. Unfortunately, we do not have that luxury. The bad thing is so much worse than we ever thought it could be that we cannot ignore it.

If we cannot find some solution to the problem, then the alternatives appear to me to be absolutely intolerable. To try and sell up and move would on the average involve a financial loss in the vicinity of $100,000. It was eloquently and movingly, I felt, put on Friday that that just passes the problem on to someone else. The conditions of the goodwill buy-back are just inequitable and they are an insult. To stay for many is a sentence to ill health and discomfort. What makes the whole situation so galling is the knowledge that there is a solution, which although it may not be complete, is probably sufficient to enable most to stay, and that is a simple combination of particulate filtration and increased vent speeds, similar to that which was put into position as part of the RAPS agreement.

We are bemused by the constant assertion in the study carried out of the air quality around the stack by Holmes Air Sciences that there was no change in the air quality and that consequently the stack had no impact on the local area around the stack. Note carefully what I am saying here. We were bemused that that was put, that there is no change, that you could draw that conclusion with a year of operation, and that year of operation coincides with probably what is the worst drought that Australia has ever experienced, in other words a completely unusual set of weather conditions.

The report by Holmes Air Sciences actually does not draw that conclusion. They were not able to draw any other conclusion, except that the air quality between December and July 2001, which is pre-stack, and the air quality between December 2001 and July 2002, which was post-stack, was very similar. That is different to saying that there has been no change because to say there has been no change is a finding.

The data is so similar that there is no statistically significant difference between any of the average figures quoted. The mean figures differed by less than 10 percent when you look at them between the two years, and the measure of error, the standard deviation of each of those means, is between 30 and 50 percent. So there is absolutely no statistical inference which can be drawn from it.

In such a variable sample, a change would have to be very large to be detected at all, and I suggest that an even-handed and responsible report would have attempted to address this problem and answer this simple question: Is the method used in the analysis sufficiently sensitive to detect the type of change that could reasonably be expected? Ask that question. Can it detect the predicted changes, which are of the order of a couple of percent? That is what was suggested in the pre-stack air quality monitoring. I put to you that the answer is a resounding no.

The compliance with the air quality goals, when they got the stack approved, they claimed that they could comply with the air quality goals, and that was on the basis that the addition that was going to give them the highest reading was 0.9 micrograms per cubic metre. When that was added to a predicted background of 48.4 micrograms per cubic metre, that gave them a total of 49.3 micrograms per cubic metre, and that demonstrated compliance with 50 micrograms per cubic metre doubled. Now, that is rubbish.

At the meeting of the community consultative committee, of which I was then a member, I asked a number of questions probing into this, which was to me a suspicious change of extreme accuracy. I have been a scientist for 33 years. I was given incorrect and misleading information and deflected from exposing this sham. It was, I believe, deliberate. Not only was the claim of compliance completely unjustified scientifically, but it is now known that at that stage the Earlwood air quality station was underestimating by 20 percent, so that that 48.4 goal was 20 percent higher percent. The result should have been 59 micrograms per cubic metre and the stack design should never have been approved. If the accurate advice and information had been given when I asked for it, we probably would not be here today.

I believe that in fact there are clear examples of impacts of stack emissions on the monitoring stations and one of them, a specific one which is fairly clear, is included in the RAPS submission. There are many, many others. The one that is shown was sufficient in two hours to add about 30 micrograms per cubic metre or 1.25 micrograms to that day's reading. With the variable winds that we have around the stack, many of these of course go undetected. This is effectively a graphical representation of the video of the plume strike that many of you will remember from Dr Manins' presentation to the last inquiry. I apologise to those who have not seen it, but this is a plume strike, there is a great big high sort of impact.

The thing that alarms me most of all is the constant suggestion that, because the monitoring data does not show anything, there is nothing to show, and here is all this illness and discomfort, the coughing and the wheezing, the headaches and the sore eyes - all imaginary. That is the implication. The logical conclusion is actually that the tool that was expected to provide the information and to truly monitor such possible impacts has been proven to be incapable of doing such a task.

When talking about standards and conditions for air quality I believe that it is important to put them into perspective. To help you, I have prepared an overhead. I am sorry that it is not clearer. There are seven days in each of those. The stations are U1, T1, X1 and CBMS. Imagine that the stack is roughly in the middle of that diagram. The days, which are marked, were days last week. We had one day of very bad pollution due to a dust storm and another day of very bad pollution due to a bushfire. Everyone was complaining about it. On none of those days did the pollution go over 50 micrograms per cubic metre at any of those stations. It got to 50 at one of them, but it did not go over it. The regulation says that basically you can pollute up to 50. So long as you stay below 50, it is okay. If you go over it, no. Now you know what 50 means. It is like last Wednesday and last Thursday. The stack is technically able to pollute up to that level and still comply.

I say that that condition is wrong. That condition is flawed; it is faulty; it is completely unacceptable, and there are lots of other descriptions I could put to it that really should not be entered into the Parliamentary record.

What I would like to do is throw down a challenge to the Department of Planning, the Department of Health and the EPA to provide us with just one example of such a condition anywhere in the world which has successfully provided the sort of protection that it is expected to give. I have certainly searched very assiduously and I cannot find one. I can find it for things like nuclear radiation and even sulphur dioxide, but not for vehicle emissions, because they are hard to pick up. I am aware that others have tried and that other jurisdictions have used similar schemes, but have any of them actually worked? Where is the quality assurance? It is such an attractive idea, but it is an untested one. You do a simple measurement and you predict a possible health outcome for a specific group of people, a number of individuals. It is not a statistical entity for a city. Before you say that you can predict such outcomes, remember what happened in the cryptosporidium scare. All of the scientific evidence, and no one got sick. So much for scientific certainty and technological optimism. I am a technological optimist, but what we have put forward here is just not going to work.

You have to pull back from these things and you always have to try and be realistic, I believe. We have a tunnel; we have a stack. It is an important piece of infrastructure, it fulfils a real need, but it is not satisfying community expectations. When we are talking about this, let's be very fair. I watched Nick Greiner this morning. I believe that Baulderstone did a really good job. I believe that they built a tunnel to the specifications that they were given, but the specifications were wrong. I do not want to criticise because it is a piece of really good engineering, but it has one real problem. It doesn't really matter if the tunnel appears to meet the guidelines that were set for it. Remember that the community actually had no say in determining what those guidelines might be. There was some

community consultation - we did not get consulted about the stack - but there was no community consultation about the conditions of approval. That is something that happens up there among the clouds. The proponents obviously have a say because we have seen them having a say in relation to the cross-city tunnel, but the public does not. Those that have the most to lose and actually the most to contribute never get a chance to look at the final draft of those conditions. The reality check of those conditions is occurring now and I say it is a fail.

It is fairly clear that carbon monoxide, although it is a problem inside the tunnel, is never likely to be one outside of it. Equally, nitrogen dioxide is about a third or a quarter of what was predicted previously. If it was to be a problem, it is going to be much less than we thought. The situation with volatile components like benzene and VOCs is less clear, it is an open question and I do not know an answer to that. It is, however, obvious to us that particles are the greatest hazard outside and probably, in the long term, inside the tunnel because they can accumulate through regular exposures. It is like the old-time coal miners building up the coal dust inside their lungs from going down into the mine every day. Most of us will not go down the M5 every day, but other people do.

We have said over and over again that the available filtration technologies could contribute to a large degree to make the project safe and acceptable. We are convinced that the technology is effective and that particle emissions are by far the greatest threat to the local community. What is the basis of our conviction? Although we have had our views and our wishes about the stack - and the main one is that it would just go away - we have always tried to base our decisions and our requests on hard checkable evidence and I intend to run through some of that with you.

The RTA has made a number of claims about electrostatic precipitator equipment and some of it is true and some of it, I believe, is false. They have constantly said that it is used overseas in smoky tunnels. This is true and if there ever was a smoky tunnel it is the M5. They have also claimed that the equipment is incapable of removing fine particles from exhaust from tunnels and thus is not really as good protection from fine particles because that is what actually does you the harm. Now this is a pernicious argument. It is false and it is untrue. They certainly have never attempted to back-up their assertions to me with any sort of original or scientific documentation. Let's face the reality: If they can convince me then a lot of this problem really will become much less fierce. They have never ever attempted to do so. You have always got to try and see where the other fellow is coming from. You have always got to try and understand where he is coming from, otherwise you can never combat. We can find no evidence to support that assertion as it relates to modern equipment used in road tunnels, except for one paper delivered to the PIARC Road Congress in Montreal in 1995, and I will provide you with a copy and a graph that I will refer to. That appears to show a low efficiency. What has actually happened is that they have used an inappropriate testing substance called DOS which is not electrically conducted and it was originally used for working out the efficiency of electrostatic precipitators in nuclear submarines in removing oil particles, or that is what I am told.

The next one, which is number 3, is a set of technical reports. Now there are a series of these. They all come from Norway, but they have nothing to do with CPA, they are all independent reports from the equivalent of a CSIRO testing unit. This one does a series of tests on electrostatic precipitators and shows a particularly high efficiency as claimed using diesel exhaust, which obviously is what you would use if you are going to test the efficiency of something you are going to use in a road tunnel. Then they say that the installations do not always live up to the manufacturer's predictions from the laboratory and those are the laboratory predictions. This may or may not be the case, but it is specifically contradicted by evidence from Norway. This is something from the Norwegian roads authority which says that the tunnel is actually working very well and working according to its specifications, what was predicted inside the tunnel.

Let's look at some other tests inside tunnels: The Chimbu tunnel in Korea. The test was carried out by the same testing group. There there was a demonstration of Murphy's law: Everything went wrong with this one. They left a door open between the back and the front of the filter; the fans went off; the power failed; traffic volumes kept on growing. Even so, over three days of testing, they were able to demonstrate that they had the required efficiency of better than 90 percent in that tunnel under real conditions. That is the equipment installed in a real tunnel tested under as realistic conditions as you can.

I have some others. These are the tests from the Laerdal tunnel. Unfortunately, these are in Norwegian, but I have provided a rough translation of the crucial parts of the one from the Laerdal tunnel. I have not provided one for the Stromsas tunnel which has just opened. These show the same sorts of things. They show compliance with the contractual recommendations, 90 percent efficiency or thereabouts. We have a problem with what is happening in

Japan. We seem to be able to get information from Japan. I will table this. We seem to be able to get information from them. I do not know why the RTA cannot get information from them.

RAPS in general, and I in particular, take the responsibility we hold to this community very very seriously. We are aware that the people depending on us are not faceless but they are our friends and neighbours. They are the people we talk to in the supermarket. We and I have investigated this problem to the best of our ability. We cannot see that the RTA or the other authorities have done so. The only serious investigation, which is now out of date, was carried out by Sam Haddad in 1997. Although it is two inches thick, and certainly expensive, the survey carried out for the RTA by Flagstaff Consulting under the conditions of approval, appears to us to be superficial in its analysis and very partial in its conclusion. It does not attempt to resolve the contradictions that appear. Even within the report there are contradictions, and in fact it does not correctly report its own contents.

I draw your attention to the submission by Professor Morawska, which is a written submission to you. She is probably Australia's foremost expert on fine particulate impacts and she advises the World Health Organisation. She is a good person. This is the sort of person we go to and ask for advice. Her observations on the ability for EP technologies to remove fine and ultra-fine particles are based on her own measurements and they use appropriate instrumentation, rarely used elsewhere. She directly contradicts the claims of both the RTA and Dr Child that Dr Child made on Friday. She shows in fact the efficiencies of fine and ultra-fine particulate removal is as high as 90 percent at levels down to, not 0.2 microns, but 0.02 microns. It is an exceptional efficiency, the whole order of magnitude.

I know that this is terribly difficult and tedious. I would be loath to accuse the officers of the RTA of tendentious argument and lack of intellectual honesty, but until they show that they have approached the problem with the same degree of rigour as we have attempted to do, then I for one will continue to think as I do and continue to advise others likewise.

Finally, if we can find a way to fit precipitators into the tunnel, then we will be able to significantly and safely reduce the impacts of particles both inside and outside the tunnel. That at least will go part of the way to removing the main cause of user dissatisfaction with the tunnel, because at the moment this otherwise outstanding piece of engineering must be judged as not fit for purpose, because it endangers those who use it and those who live around it. Thank you.

Ms MAWER: We have been very grateful for the support of the Upper House, and apart from the support that we have had from all shades of politics, except the Labor Party, and even with the Labor Party, as someone mentioned I think on the first day, that the State Labor Conference passed a motion in 2000 recommending filtration and several local branches of the Labor Party have also done the same, and individuals within Cabinet and local members privately support us but are not able to publicly.

One of the things that we really appreciated with the Upper House was the release of the documents. It allowed to us get hold of data that we otherwise could not have had. We have put together some illustrative documents I think of perceptions of different stakeholders in this project. This project is problematic and the problem was not caused by one person or one department. I think it is a combination of factors and a solution will only come from a whole of Government approach and from determination of all those involved that, one, while recognising there is a problem, two, there is a solution and, three, keep going and do something about it.

With the submission what I would like to do - you have got a fairly thick lot of documents there, I think there are about four or five copies - is just take you quickly through it in about 15 minutes and then we will go to questions.

The first document I think is a historical one and it goes to the heart of the problem, which was a political decision back in 1997. The first two documents are from DUAP, memos clearly stating that the RTA was not able, because of ministerial direction, to distribute material on appropriate post-exhibition changes. I thought that might be interesting information, particularly for the two new Labor members who were not with us in the 1999 inquiry that looked extensively at that issue.

The second document, if you have a look at the footer, is really quite revelatory, in that it says:

... Health had originally specified that these ambient goals should be used as the standard for air emissions from stacks. Such goals are inappropriate

> to be used as a standard for a point of source emisssion.

So you had a decision made in private, behind closed doors. The department is being told not to go out to the public to get any kind of scrutiny or feedback. At the same time, we have departments who are the regulatory, advisory departments, knowing they are using inappropriate goals, inappropriate regulatory frameworks and wrong standards, and nothing was done to stop that.

Then we pass straight to the actual tunnel opening, because, as you know, we have been through two inquiries in this matter and workshops and all sorts of futile attempts at trying to get the decision reversed, and the key recommendation that was supported by all members of the inquiry back in 1999 was a very low risk strategy really, if the project had any viability or merit in terms of environmental and health protection project, it was to put an advertisement in the paper to see if something could be done to filter the emissions from the tunnel. That was supported by all members of the committee. The RTA decided not to do that. So despite two inquiries and lots of protests, we go straight to the opening of the tunnel, and within three months - unfortunately, some of the briefing notes within the RTA are never authored or dated, and that makes it difficulty to get any kind of accountability or scrutiny, and that might be something the Committee might like to look at, but we know from the document it is actually quite obvious that it was in February. Within less than three months of operation, three fans had broken down out of the 14, and contrary to assertions made or statements made this morning by Baulderstone, if you have a look at the third last paragraph:

> ... there is no more stand-by capacity available at either the Turrella stack or the western cross over, any additional fan failures at those locations during the next 1-2 weeks would seem to compromise the RTA's ability to comply with the intent of PlanningNSW's conditions of planning approval.

Teething problems occur; we understand that. Apparently the problem was with the fans coming over from wherever they came from, from the other side of the world, et cetera. However, I think the crucial factor is the public was not told, and what they were looking at was using portal emissions. On the page that starts "Considerations", the third paragraph down talks about, look, really Condition 70 talks about the design of the tunnel needing to avoid portal emissions, but it says nothing about operations. So right from the very beginning we have an RTA that is actually very willing to bend the rules to suit itself and look at portal emissions as a way of getting itself out of problems, rather than admitting that something was dreadfully wrong with this tunnel.

The next document has the RAPS letterhead on it, and that was the one that Judi Rossi referred to, where in April we wrote to all the departments, the Health Department, Planning, RTA and EPA. That was after the meeting that we had that Judi Rossi has alluded to. In that document we had written complaints from people. We had 80 people who were willing to put their name down and say, "I have suffered X", which is really a big ask in a community like ours where a lot of people cannot spell their names and a lot are very suspicious of Government departments, because their experience of Government departments has been in the countries they have come from, there are dire consequences for complaining, not the open democracy that we are supposed to be living in.

The last three paragraphs, I think you will see that we drew to the attention of Planning that under Approval Condition 73/4 there was a complaints procedure supposed to be set up; not only that, but also localised monitoring Sue Holliday I think in her evidence said that in the trumpeting of success of the tunnel and the fact that there was no impact, that no-one actually asked for localised monitoring. There it was in writing back in April. Our problem was that when we asked the RTA for localised monitoring, they said, "Well, really, no, because first of all we have got to compare it with the in-stack emissions which we haven't got yet, and anyway, you have got it on a station within 20 metres of your house", when I asked, other people said, "I don't really want more rubbish because I know what is being measured from what I can see on the web site showing nothing, and yet I am wheezing during the day and waking up at night with a headache."

At any rate, we did ask and we did register concerns and we did alert the department to that problem, and you would have thought that duty of care would have required them to do something about it. The response we got from PlanningNSW on the following page was, "Go back to the RTA, and to date the department has not received any specified localised complaint", as if somehow those 80 that we had sent in were not localised complaints.

So that has been our experience of the department, and we could have photocopied this four times because it has been somewhat similar. The EPA at least granted us a meeting; the RTA, as always, does not respond; and the

Health Department, as you know, have been put off by the RTA from attending meetings with us or investigating. It has been quite a long time coming, their study.

That is the communities perspective. If I can go through some documents now that are internal documents from the RTA, in July Phil Gallagher wrote to David Tucker, reminding BHBB of their contractual obligations, and on page 2 of that document you will see that the contract requires that the motorway be available, at all times open to the public for safe, continuous, efficient passage, that it be fit for purpose, that it is operated so the requirements of the environmental documents at all times are met.

The following page, there is a provision there to develop and update the operation and maintenance manual to take into account the changes to the environment, generally accepted environmental management practices, new risks to the environment, any pollution or changes in law, any requests or requirements for the Environmental Protection Authority or other authority, world's best practice in developing standards, et cetera.

We knew, as members of the Committee here would know, that this tunnel was absolutely unique. You will find no other tunnel like it in the world, and we hope to God it is the last tunnel in the world that is built like that. It is one of the world's longest tunnels, certainly the longest in the southern hemisphere. In terms of traffic volume, it is one of the heaviest. I think it ranks among the top ten. It has one ventilation stack in a valley. It makes about as much sense as building a lighthouse at Penrith, and yet it was decided that that was a viable proposition.

You would have thought there would be some sort of watching brief once this tunnel opened, that if there was a problem, there would be a willingness to do something about it. The reminder here is not really about air quality; it is about poor response procedures, certainly internal air quality, traffic management, a whole lot of operational problems that were occurring.

The next briefing document is from the Roads and Traffic Authority. Again, it is undated, but you can see from it that it is a document that was written some time after 10 July, because it refers to a letter of 10 July. On the second page it says:

> Lane closures to maintain air quality goals are becoming an increasingly common, almost daily, event for periods of 15-30 minutes during both AM and PM peaks. Lane closures have a substantial impact on network efficiency and road user costs.

It also says BHBB have had limited success in implementing appropriate traffic management in a timely manner to maintain acceptable air quality in fully congested traffic conditions.

As Noel Child diplomatically said I think on Friday, the tunnel has been a victim of its own success. It has 2010 traffic in 2002 traffic and vehicle and emission conditions. That is fine, that is unexpected. However, it is a recognition of the problem by the RTA and the contractor.

There are then three documents from Planning NSW, and I know we are running out of time so I will not go through them, I will leave them for you to see, except if you wouldn't mind going to the document called Planning NSW. You are not looking at just one tunnel, you are looking at two that are about to be approved. Under "Strategic Lessons for Other Tunnel Proposals" on page 6 it says:

> The issues raised on the M5 East indicate that while there was much focus on the external air quality issues the in-tunnel conditions have proven to be more problematic.

I suggest that is not more problematic because of their impact, it is because they are more visible, because it is a confined space, because you have 100,000 people a day going through it who can ring up talk-back radio and complain. Everybody can see it. If we had people visiting our houses at the rate of 100,000 a day, it certainly would be equally as visible.

> To some extent this may be systematic of designing tunnels to meet specific air quality specifications without leaving spare capacity for any irregularities.

Over the page he makes a recommendation for a more strategic study into better understanding the design of tunnels and, in particular, the relationship of the design to air quality outcomes, both short-term and long-term guidelines, relationship to fire/safety issues, the degree of risks/contingency built into the design and potential

construction and costs impacts of improvements.

Then there are three letters from the EPA, one in June saying that the EPA is concerned that traffic management procedures cannot respond to in-tunnel air quality problems and that the commitments made during the construction in relation to the tunnel's ability to cope need to be resolved as soon as possible. One of the interesting things from the EPA is that because they have had experience with licence conditions - and I think probably a bit more experience than Planning NSW - they are very clear on what constitutes a breach and what does not. From reading the documents of Planning NSW, they are very quick at back-pedalling and saying: Well, is it really a breach or is it an exceedance? Is it an exceptional circumstance or is it really perhaps a failure? The EPA is very clear in the document that is entitled SR479/03 on page 2:

> The outcomes of the meeting were in agreement that an exceedance in any tunnel air quality monitor was a breach of consent conditions.

There is no question about the 15 minute exposure or watering down of the condition that we have heard discussion about from different people. On the very last page it says:

> Planning NSW would have to take legal action against RTA for breach of consent conditions.

That is what the community expects. If we have strict conditions then we expect strict enforcement, otherwise they are not strict, they are not worth the paper they are written on.

The next page is Health, to which I think the Honourable Richard Jones referred, where Dr Vicki Sheppeard said at a meeting, quite wisely and prudently, taking a sensible precautionary principle, that if that is the impact that the M5 is having maybe we need to have a second look before we approve any more tunnels.

I now turn to the workers and the people who use the tunnels because I think, as residents, as taxpayers, as motorists, we would like to think that a government has a duty of care to all people.

There is an anonymous fax that was sent to the Herald and it was found in the documents in Parliament - I do not know how it got there - in which an operator from BHBB says that:

> There are grave concerns regarding the quality of the tunnel air with the lane closures occurring almost daily with the acceptable limits being exceeded. The motoring public is being misled and the standard of the air in the tunnel during peak periods is above acceptable limits daily between Monday and Friday during peak hours,

Almost repeating word for word the words of the RTA's brief to its chief executive officer.

If you did not believe that and you thought it was someone who was cantankerous, have a look at the incident reports, starting with one very early on in April - and we have just picked a few of hundreds of incident reports - where a police patrol car rang them to complain about air quality in tunnel and the response is the police gave her no information as to where and when this occurred and she said not to worry about it until they ring back again. We have had police feeling sick, nauseous, having to take days off, just for doing their job of rescuing someone in the tunnel, because of poor air quality.

There are several incident reports that I will leave for you to have a look at in your own time, but they clearly show that there is traffic congestion on a regular basis. There is an incident called degraded tunnel air quality. It is semantics when the CEO of the RTA says "We only close a tunnel or a lane in relation to incidents". The incident is degraded tunnel air quality and you can see that in the box where it says "Incident Type", or "Congested Conditions", which is another type of incident report, traffic congestion. That is the one that is a landscape version.

The last incident report is also very serious because, while there was no actual exceedance, what happened was that Anthony and Jamie report: After attending an incident which was a truck that was stopped in the tunnel, both of them feel unwell, nausea and headaches. At the time of the incident traffic was extremely heavy with CO reaching around 80 parts per million, not quite the 87 that makes it an exceedance, but high enough to make them sick. “Anthony was exposed to the elements for 53 minutes; Jamie arrived shortly after Anthony. Both endorsed the injury register. Des informed of situation".

This is information that obviously is not filtering to the RTA or that the RTA does not want to know about. Either way, you would think that this tunnel would be safe for motorists and for workers and we find it really incredible that people can go on radio and go in the paper and say what a fantastic successful project this is because people avoid 26 sets of traffic lights. They have to be able to avoid them safely.

Then we pick three complaints of people who were so outraged by their free trip in the tunnel that they took the time to write two or three-page emails highlighting issues such as being stuck in the tunnel for over an hour from 11.30 in a queue of 60 cars because there was an incident, not knowing what the hell was going on, having fire trucks and police cars rambling past them, not knowing whether they could get out of their car or not - some did and almost got run over. I think you heard something about the trade-off from the Health Department, how really you have to look at the congestion freed up on other streets. The incident report that is in bold italics talks about this poor man from Ingleburn who travels in the tunnel and how he feels that: "The RTA and the Government owe me about five years of my life spent on your fantastic efforts and how now it is a car park on the M5, now the M5 East. Somehow you have to look at the air quality and increased pollution on that side of the road". He talks about the tunnel design being a joke, a sick joke.

I will not go through the rest because we are running out of time, but I will go to the Honourable Mr Debus's letter to the Honourable Craig Knowles, the Minister of Health, saying how the EPA Board has asked me to raise directly with him the importance of an ongoing role for NSW Health in assessing possible health impacts as part of a whole of government strategy to improve community information on this issue.

I think from all parties we can see that there is a real concern being registered.

Finally, for us poor guinea pigs in this environmental experiment, it has been put by several people, including the minister, well, we have this property value guarantee and we can move. The last documents are just about two people whose experiences I think illustrate well the dilemma that people are in: They are sick. Both of them were probably on the sensitive end of the spectrum with allergies and different problems. One of them actually wrote and asked to be included in the property value guarantee before the tunnel opened, because he actually is on a pension because of allergy related problems, and he was refused and after intervention by George Thompson, his local member, he was actually allowed to be part of the property value guarantee.

The other person, similarly, has had a house for sale for six months, just like the first one, and one of them is here today if any of the people on the Committee would like to speak to them. No-one wants to buy their house, certainly not anywhere near market value, and we have got this wonderful property value guarantee. There were three recommendations in the last inquiry in relation to that. This was a goodwill gesture that we negotiated between the CFMU and Carl Scully because there was a threat of a green ban.

Just like with the health study that we had to fund ourselves to get somebody to listen and Health Department registering there was problem, we went to a barrister, and you will see his curriculum vitae there, Alan Hyam, who specialises in areas of property law, rent reviews, environmental and local government law, building law, et cetera, he writes text books on the issue, is a very highly respected person. He says on page 4, at 4.1:

> It seems to me incongruous that the 2001 Procedure is less generous than the 1997 Procedure, and that the provisions of the Just Terms Act are excluded.
>
> 4.4. It is apparent that the RTA has blighted the properties within the area in which the 2001 Procedure applies.... Because of the blight factor those owners would be unlikely to be able to sell their properties at unaffected prices.
>
> 4.7. It appears to me that the procedure is not logical. What the RTA is saying is to try to sell your property on the open market for a lengthy period of time, and if you are unsuccessful we might buy it at an unaffected value, but we won't pay you until we have sold the property. We will not pay you any of the items of compensation to which an owner would be entitled if the property was acquired pursuant to the provisions of the Just Terms Act. This certainly is not in accord with the notion of just terms which is enshrined in the Just Terms Act.
>
> 5.5. By implementing the 2001 Procedure the RTA has acknowledged that the M5 East stack has injuriously affected the properties within the designated area.

Then he talks about the fairness and the morality of the procedure.

> Whilst there is no legal obligation on the RTA to acquire the properties, it has accepted that it has a moral obligation to do so. Therefore, it must at least have a moral obligation, if not a legal one, to comply with the statutory requirements in acquiring the affected properties, including the payment of compensation in accordance with those requirements.
>
> Ignoring the morality of the 2001 Procedure, the requirement that owners offer their properties for sale on the open market for periods ranging from three (3) to six (6) months appears to me to be both unfair and unrealistic.
>
> It is common knowledge in the real estate industry that a property, particularly a dwelling house, becomes stale after it has been on the market continuously for a period in excess of six (6) to eight (8) weeks.
>
> 6.4 It is my experience that the visual effect of a structure such as the M5 East stack, and the knowledge of its purpose, can have a detrimental effect on the value of affected properties....
>
> ... because of no fault on the part of the affected property owners that their properties have been blighted by the M5 East stack. The community as a whole has benefited from the construction of the M5 East Tunnel tunnel, however, the affected owners are being asked to bear the burden of either suffering from the effects of the emissions... consequent diminution in the value of their properties, or suffer because of inadequate compensation payable under the 2000 Procedure.
>
> Therefore, I consider that it is not fair that the affected owners should be asked to suffer from offering their properties for sale on the open market for an inordinate period of time, the deferral of the purchase of replacement properties until the RTA has sold the properties, the payment of an increased price for replacement properties because of the delay, and to receive payment on less than generous terms than those paid to owners under the 1997 Procedure or the provisions of the Just Terms Act.

The word "blighted" was not quite a part of my vocabulary, but it certainly, I think, summarises well how we feel about the whole situation. The M5 East stack certainly has been a blight on our community, personally and socially.

You heard from Planning, the regulators, that even thought they are talking about PM2.5, it will not be used because they cannot change the conditions. I am not sure if that came across clearly enough or not, but we certainly are learning to read between the lines, and PM2.5 certainly will not be applied to the Cross City Tunnel because it is not legislated and therefore it will not be applied retrospectively because its approval cannot be legislated.

I think it is quite clear from their evidence to you that they found it easier to redesign the procedures as exceptional circumstances, but nevertheless they were very concerned. Under Condition 73 or 74 they can require the RTA to install filtration treatment systems, but you have seen their reluctance to own up even just to directing the RTA to do lane closures, let alone something as big as filtration.

You have heard from the RTA, I do not know if it is in here, but certainly the pamphlets, if you have a look at the pamphlets on how to use the tunnel, they will tell people to take their sunglasses off, but they certainly cannot tell people to wind their windows up because that might be some kind of admission of liability. They are still very much in denial publicly that there is any problem, and they are putting an awful lot more effort into filtering the information rather than the emissions.

The dissent statement from the Labor members last inquiry put a lot of reliance on the regional air quality and the pollutants in that. The RTA told you there were I cannot remember how many applications for the wood fires. However, what they did not tell you was that three people have taken out the wood fires. Dr Manins talked about what an incredibly good idea that was, and we agree, let us have no wood fires across the whole of Sydney, but three wood fires and 256 smoky vehicles that were reported to the EPA out of 25 million, and tell us that is an incremental improvement that is worthwhile pursuing - it is just insulting. Those words come from the RTA, and we can give you more documents if you want that.

There certainly have been problems with stacks, with the Eastern Distributor and with the Harbour Tunnel. Even though they are shorter tunnels and have less vehicles, we know people are affected. This tunnel, as I said before, is unique; it has unique problems in terms of its impacts and is going to have another unique little cousin if we do not do something about it.

BHBB I think made it clear that they can also take measures to improve things if there is the will there to do that. The EPA is limited in the authority and the protection that it can offer to our environment. Its advice may or may not be taken up; it is concerned; it can improve complaints and reporting procedures, but seems reluctant to be able to enforce a condition where they can force the RTA to put in filtration to improve in-tunnel situations.

Lastly, you heard from the Health Department that they are concerned that at very best it is going to take them 12 months before they come back and tell us that it is a learned response that we have developed an allergy to the stack, and we just have to be grateful for the fact they are watching us getting sick, rather than protecting our health.

We certainly hope that we do not have to come back again and that somehow there is a will to find a solution, and I am sorry I have gone over time.

The Hon. JOHN RYAN: There has been a bit of discussion about the 40 tunnels, filtered and so on, and reference to how unique this tunnel is. Is there any capacity of RAPS to put together for the information of the Committee an updated schedule giving us some idea of where they are, whether they are filtered or not, how long they are and what their traffic levels are by comparison, so we get some idea of how this tunnel compares with others overseas? You seem to be the only people who have even chanced your arm on that. I realise it is a bit of a significant research task, but if it is at all possible, could you do it for us?

Mr CURRAN: There is a problem with numbers. Different authorities count in different ways, and in some cases each individual tube is counted as a separate tunnel. I cannot actually resolve the whole of your problem, but if you look in the back of the Connell Wagner report, although they do not report on it in the main part of the report, there is actually a list there provided by the Japanese of the built tunnels. I suspect that that is a pretty good one of the stuff that was done by Matsushiba. I believe Fuji may have some other ones that we do not know about. We have not been able to get any information from Fuji at all. The different parts of Japan seem to cope with these things quite differently. It is such a normal technology over there, that it seems to be decided almost on a local basis. If you are going to build a road with a tunnel, then you decide whether you build it or not. That seems to be the case.

I think it is safe to say there is a significant number of tunnels, certainly a significant number of tunnels there. The tunnels that they talk about are very interesting when you actually compare as much like for like as you can. We are always told that the Japanese tunnels are much dirtier than ours. I am prepared to accept that. If you look at the Tenasone tunnel, which is supposedly the largest tunnel in Japan in traffic volumes, 120,000 vehicles per day, it is only two kilometres, it actually has four lanes either way. It, from memory, treats 2600 cubic metres of air in its filtration systems. I have put the figures in there. Three quarters to two thirds of the total number of vehicle kilometres. Yet you have got three times the amount of air being used for ventilation than is being used in the M5. I think they must expect the laws of physics to have been changed for the southern hemisphere, that you do not need as much air, because where I have tried to compare those sorts of crucial things, they do not seem to line up.

Ms MAWER: If I could just say that paper that we tabled from Japan, when I wrote to the Japanese a year ago, they wrote back very polite answers to specific questions and there is a little table there about the Tenasone tunnel and I think from memory it was in the high 20s, I think they said 27 or so. So that information is certainly there.

Mr SIAPOS: If I may add, you probably will not find a tunnel like the M5 East tunnel, which is already over-used, which already has lane closures as a traffic management plan, I think the only time you can fully use the M5 East tunnel as it was designed and for the speed it was going through, without any lane closures or any other intervention, is on a Sunday afternoon. At this stage, almost every peak hour you will have lane closures or some sort of traffic management outside that process. So the table in terms of those tunnels will probably need to say how many of those tunnels actually operate at full 90 percent efficiency compared to the M5 East, which does not seem to.

The Hon. MALCOLM JONES: Can you just expand, briefly please, on your disappointment with the property guarantee from what was originally promised to what the reality is?

Ms MAWER: Certainly. When the tunnel was announced in 1997 the history of a contentious campaign for three stacks, et cetera, as part of the approval conditions in 1997 was a property value guarantee for people living immediately above the tunnel and within 100 metres of the portals. That procedure allowed people to ring up the RTA and say, "I want to move". An independent valuer was appointed. They came; they valued the property; they assessed a fair market price, plus a whole heap of extras, such as the stamp duty, real estate fees. I think it is detailed in our submission towards the end.

We were seeking something similarly. It is page 42 of our submission. When we were still pursuing either a radical redesign of the ventilation system or filtration of the stack, depending at which point of the continuum we were at the time, we contacted the CFMEU who were building the tunnel and they were very sympathetic to our cause. We went to see John Sutton to see if we could get filtration and actually put a green ban on the project. In February 2001 the minister announced the offer which was the result of negotiations between the CFMEU and the RTA where they lifted the ban. I know from speaking to the national secretary, John Sutton, at the CFMEU, that he was under the impression at the time of the negotiations that we got the same the procedure and in fact the media release that came out from the minister said that we got an extension. An extension usually means the same as. However, when we got the fine detail after it had been approved it was very, very different, a much more punitive, much more restrictive offer. None of us really want to move, we love where we are, we love our community.

The Hon. MALCOLM JONES: What were the terms of the new offer?

Ms MAWER: On page 42 there is a comparison between the two. I am in the process of selling my house at the moment. My son has not been living with me since June. I work from home and I cannot afford to have my windows open any more. I have a particle filter. I have decided that I just cannot stay, work and live in this toxic environment, so I have put my house up for sale.

Initially I actually wrote to the minister - and you have my submission I think about that - and said: Could you please buy me out? Do I have to go through the six months? Here are my medical certificates for both myself and my son. The minister wrote back and said, no, bad luck, join the queue, wait for six months. So my house is for sale at the moment. I have to wait for six months. Then I have to show that I was not able to get market value for the house. I have to ask the RTA to give me a value, which they will not tell me now. I actually rang a few days ago and spoke to the property manager and I said, "Look, can you come and give me a value so that I know", so for example if I am asking X and you are going to give me X plus one, because it is unaffected market value, I would like to know about it, otherwise I may miss out on a good offer. He said, "No, we cannot tell you what it is worth because you have to have it on the market for six months". I said, "But in this volatile property market, if I put it on the market now, in six months' time it will be different", and he said, "That's right, that's why we can't give it to you now. You have to wait six months". I said, "Well, what about the fact that medically we are affected and we'd like to move?" He said, "Well, sorry, we can't take that into account".

Here we are in the situation of having to wait six months and then see if the RTA is going to give me something that may or may not be as much as what a prospective buyer could have given me. After that there are no relocation costs at all. In my personal situation I will be about $100,000 out of pocket in the move. Does that seem a disappointment? I mean I think my example is one of many.

The Hon. JOHN RYAN: I think one of the significant differences is the treatment of stamp duty on your new property.

Ms MAWER: It is stamp duty, legal fees, removal allowance, survey fees, building/pest report, disbursements, plus you have to pay for your own advertising campaign and your own independent valuation if you do not agree with the one of the RTA, plus it is limited to 270 properties within a 400 metre circle that does not accord with either the visual impacts or the worst air quality impacts, so there are quite a few people and those two people who are detailed in that bundle of documents we gave you were just outside the 400 metres.

Mr SIAPOS: The impact on a $500,000 house would be $26,000 less in terms of stamp duty and other relocation benefits and obviously as you go up it is higher. You can see why it does not match what our barrister says, the Just Terms Act.

The Hon. JOHN JOBLING: Are you aware of anybody that has attempted to sell their property that has been successful in the RTA taking up their property and, if so, what has been their experience?

Ms MAWER: Not one. I think the question was asked in Parliament. Not one.

The Hon. JOHN JOBLING: I just wanted to check that it was still the same situation.

Ms MAWER: Yes, exactly. Mind you, with the other one I believe that there was a question asked at budget estimates last year and certainly there were a number of properties that took up the offer, something like 68 properties I think, because it was a fair offer. It does not pay for the intangible things of having to find new friends and new doctors and family. My neighbours, for example, have their parents next to them. Another neighbour has three generations of people there. It is not so easy to relocate.

Mr BRIERS: Might I add that, to me, the offer of a property value guarantee is an admission by the Government that they have a problem. They want to buy their way out of the problem. It is immoral. Firstly, they have a problem. Secondly, they actually make money, when you sell, on stamp duty. Thirdly, people with consciences, if you see a buyer coming up who has two young kids with them, what do you actually tell them? Do you say nothing about the stack? It is a disgraceful situation that this Government has put this community in.

CHAIR: Can I ask generally whether you have any specific points to make on evidence given by previous witnesses on Friday or today?

Mr BRIERS: Well, the evidence put forward by the RTA this morning was that the road is now at capacity during certain hours of the day. The road is at capacity, the traffic is moving through the tunnel slowly, engines are not working efficiently, so we have a tunnel absolutely chock-a-block. Does that mean that traffic will now come back on to the existing road network, particularly in our area? We are copping extra pollution from the stack and we are going to have all these vehicles back on our roads again, so we are absolute losers all round.

What can we do about these situations? The RTA should be answering these questions. They gave themselves a six month progress report. You would think that this tunnel was the greatest thing that has ever happened to our community. The only thing that is on the front cover is the RTA monogram. We do not know where they got their evidence from. The key stakeholders are the community and they were not consulted. It is time that the RTA gave correct answers to properly prepared questions.

Mr CURRAN: As you will realise, this has been a rather stressful experience for us and I cannot remember what happened last Friday. I remember there were things that I would have liked to respond to. Would it be possible to make a supplementary submission in the next day or so when the transcripts are available?

CHAIR: You would need to make it very quickly indeed, within 24 or 48 hours. The report will be prepared very quickly, so as quickly as you can possibly do it.

Mr CURRAN: The problem is the transcript.

CHAIR: The transcript from last Friday will be available on the web site tomorrow and today's transcript will be available in two or three days, so probably by Friday it will be on the web site. Hopefully you could get it in by next Monday.

Mr CURRAN: Yes, I believe we could do that. There was one small thing: There was some evidence, I cannot remember who gave it, where it was said quite categorically that doing something about the particles would not have any impact on carbon monoxide. I believe that that is not true and I would draw your attention to a discussion that I put in our submission about that. I find that there is a slight error in that that was confirmed to me by Craig Burrell, that in the morning and afternoon peaks it is carbon monoxide which is driving the ventilation system, but during the day, for most of the day, it is actually particles that are driving the total, what comes out of the stack, so if that is actually removed then improvements can be made and control can be achieved of carbon monoxide. I just draw that to your attention.

Mr BRIERS: I am also a member of the Air Quality Community Liaison Group, like Mark. I do not have the minutes to confirm this yet, but there has been a lot of talk about portal emissions - just about every group here has been questioned on portal emissions - and I stand to be corrected, but I think Mark will confirm that at the last meeting I attended the question of portal emissions was raised by the RTA. They were going to make a submission to Planning to get clarification of what is a portal emission. There has to be a reason for seeking that clarification.

Mr CURRAN: That did occur, yes, they said that.

Mr BRIERS: It seemed to have been forgotten this morning when the RTA officers were being questioned.

Could I make one last statement: One of the problems we are facing here is the proponent and the construction authority are vested in the RTA. With a lot of the State Government departments, they cannot be the proponent and the constructor. They can be the proponent of the scheme, but they have to go to Public Works to have their projects brought to fruition. Surely with what has been going on with the M5 East some consideration should be given to divorcing the powers of the RTA so that they cannot be the proponent and the constructor.

Ms MAWER: Just two points that might be relevant. To put them in writing would probably be best. One of the Norwegian guidelines is for filtration plants to be activated if there are concentrations of airborne dust in the tunnel of over 300 micrograms per cubic metre for more than 15 minutes. Somebody asked a question about that and it did not seem to be answered.

The other is in terms of short-term effects of particulates, and I have two pages of literature which was from the last issue of the Lancet which I think has a lot of medical information. We are not doctors but we can read and it seemed to us that a lot of the literature is talking about short-term exposure.

(Moved by The Hon. Moved Amanda Fazio: that two pages from the Lancet be tabled. Agreed.)

Ms MAWER: Lastly, I just find it really puzzling that if there is no standard, therefore there is no problem. You would think that the precautionary principles would apply and I would implore the Committee to do something about that, because obviously there are some things that are being counted and it seems they are the only things that come up with a tick, not the ones that perhaps people do not wish to know about, and yet the problems certainly are there.

The Hon. JOHN RYAN: Mr Chairman, I cannot help but notice that RAPS have not been asked a single adverse question. In absence of that, not that I wish to take for a moment the devil's advocacy, but if we do not ask you this question you will not have the chance to respond to it.

I want to put to you that really you are a noisy and unrepresentative sample of the community; that you have been pandered to with millions of dollars worth of monitoring and studies; that you will never be satisfied; you ignore blatant scientific evidence; and that you are ungrateful for the fact that you have missed the fact that the surface road was not constructed, it was put underground, and that is a significant benefit. You should be go away and be satisfied that the Government has done best by you.

I do not believe that by the way, but I say it so that you have an open opportunity to respond to all of those allegations, which I certainly heard made away from this table.

Mr SIAPOS: With regard to the tenor of the question and the range of those issues in there, none of us here would like to have taken part in three parliamentary inquiries. None of us here would like to have had to worry about our children and ourselves being sick. None of us here would have to worry about what is happening if there was due process. One of the issues that is highlighted, we are not rat bags, whingers, blatantly ignoring scientific evidence. If you hear people like Mark Curran, we are actually on the cusp of probably more scientific breakthrough evidence with regard to air quality issues than anyone else in Australia right now.

We have actually funded studies ourselves. We get people who cannot speak English. We take the time in the local area to look at those areas and look at the science, stick our own hands in our own pockets to do whatever we need to do. We are not blatant whingers, but you can see from the evidence before you, as Charles Briers has said, you are currently looking at a tunnel which has got traffic volumes that will be 2010 traffic volumes. You are looking at a political decision to stick a stack in the bottom of a valley. You are looking at the fact that the tunnel cannot operate efficiently. You are looking at a tunnel that is jam-packed. You are looking at people who will get all the traffic back on the streets as they had before. You are looking at people here who do not get the same fair go as everybody else with regard to property value guarantees. You are looking at people here who are being criticised outside parliamentary inquiries through personal attacks and everything else.

We only only want to be where we want to be. We only want to live in the context of everybody else in Sydney, and we only want what is fair. We do not whinge, we never have whinged with regard to everything else. In an ideal world, we hope all the efforts we have done here, even if they do not benefit us here, hopefully will benefit future people with future tunnels, because at the end of the day, Nick Greiner in the article said you are going to get more tunnels through Sydney. Hopefully, those tunnels that are going through Sydney, as Nick Greiner and his company and other companies build those tunnels, are built bigger and better filtered. We are the guinea pigs in this whole process and we are the guinea pigs that are being kept in the dark by all of this. That is what has happened to us.

We do not whinge for the sake of whingeing. I would rather be somewhere else other than here. I would rather spend every Tuesday, Wednesday or Thursday night somewhere else other than dealing with these issues. I would rather be somewhere else than this. Yes, sure, we probably whinge, but maybe some people should take the time to look at the issues and think we are fair and justified in terms of doing that.

Mr BRIERS: Can we say once and for all, this notion that RAPS is against motorways, we are not. I must add that to me the idea of the tunnel to move vehicles in an environmentally sensitive area is a brilliant concept. We are having problems with the realisation of that concept. It is the stack. It is not performing the way we have been told it will perform. It is a health hazard. It is affecting our properties, our property values and our way of life.

I would rather be somewhere else, like Peter Siapos, away from here, but I cannot. I cannot get away because this problem refuses to go away. We hope from this meeting that the report handed down is not a majority report or a minority report, that it is the unanimous report of this Committee. Please, please, can we have that? Thank you.

Ms MAWER: I will be quick, just to endorse that statement and also say that just having had a chance to look at that folder, you have obviously got a lot of submissions from people who do not live in the area, so it is an issue. I know it would be hard to find a Year 11 geography student who has not studied these issues. I think the M5 East is an example of worst practice. It has been studied by people in university courses right down to primary, and it just seems to fly in the face of every Government initiative at the moment, whether it is Greenhouse, civics and citizenship, or the Labor Party looking after the little people, and I think there is that sense of injustice beyond self-interest that is fuelling us, that we do not want to see other tunnels and other infrastructure, going through the hell that we have been through this.

In this meeting and every other meeting that we have been to, with either the RTA or the Minister or whatever, we are the only people who go there who are not paid. We are sick of it in more ways than one. We are sick from the tunnel, we are sickened by the process, we are sickened by the outcome and the impact, and so are a lot of other people.

The Hon. AMANDA FAZIO: I was just interested in getting comments from you, if you have any, in relation to the fact that when this inquiry was set up there was initially an attempt by Opposition members to not have any public hearings into this inquiry, and it was a fact that, after there were discussions, it was agreed that we go ahead and have public hearings in this inquiry.

CHAIR: That is not true.

The Hon. AMANDA FAZIO: It was true. There was a suggestion put by the Honorable John Jobling at our meeting held on 24 October that there was no need to have public hearings in this inquiry.

The Hon. JOHN JOBLING: Which year?

The Hon. AMANDA FAZIO: This year. That is a simple fact, that there was a proposal put forward that we do not, because taking into account you said you didn't really like having to come here and you wanted the issue resolved finally and you hoped that there would not be a fourth inquiry into this matter. I was just interested if you had any comments on that, whether you would have condoned an inquiry being held without having afforded you the opportunity of coming here and putting forward your case.

CHAIR: That simply is misleading.

Mr SIAPOS: Leaving aside the clarification you may need to seek within your Committee itself, we have no perspective on whether an inquiry is public, in camera, private, held on a footpath. It does not really worry us. At the end of the day, all we are looking for is standards. It is the outcome that we are worried about. Whether you decide to have it here, upstairs, downstairs, it is not an issue to us.

I think more importantly, now that we have had almost 12 months of operation, you see the tunnel, you see the hazy, smoky tunnel, you see the people who live near the stack being sick. It is an issue. So take your pick how you wish to address it. All we want is the appropriate outcome on that.

CHAIR: The Honourable John Jobling may respond to that briefly.

The Hon. JOHN JOBLING: I think it is probably fair just to set the record straight, it was not suggested that it be a closed inquiry, it was to be a public inquiry, but yes, I do concede without any reservation it seemed to me that to get to the truth, to get the answers that the public wanted, we could have, because of the very great shortness of time - and I suspect my honourable colleague is suggesting that we did not want the public in, I suspect they did not want an inquiry at all - my suggestion was that the bureaucracy who were responsible, from the RTA, from the EPA, from Health, that the specific officer that had specific details be invited to come before us, so they could be questioned in minute detail or at length about failures to do things, failures to correct things or what was going on between them.

To a degree we have finished up basically doing that. We have had in addition the public groups coming to make submissions. We have a great deal of written submissions here from people who did not appear before us, but my concern was to ensure because of the time, that we had the opportunity to ask specific, detailed questions of those people who would know the specific answers which would enable us to make the correct decisions.

CHAIR: Thank you very much for providing us with your submission and giving us your time today, and thank you also to the audience for being so peaceful and co-operative with such a hot issue and I know you feel very strongly about it.

Mr BRIERS: Thank you to the Committee again for allowing us to present our case before you. I think at the end of the last second inquiry I made a comment that we are not going away. We are not going away. We want justice and equity. If we do not get it, we are going to be back here time and time again.

(The witnesses withdrew)

(The Committee adjourned at 5 p.m.)