EVIDENCE TAKEN BEFORE

GENERAL PURPOSE STANDING COMMITTEE NO. 5

INQUIRY INTO THE NORTHSIDE STORAGE TUNNEL— SCOTT'S CREEK VENT

———

At Sydney

On Thursday, 10 August 2000

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The Committee met at 10.00 a.m.

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PRESENT

The Hon. R. S. L. Jones (Chairman)

The Hon. Jan. Burnswoods
The Hon. J. H. Jobling
The Hon. J. R. Johnson
The Hon. A. B. Manson
The Hon. J. F. Ryan

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CHAIR: I welcome the media and members of the public to this hearing of General Purpose Standing Committee No. 5 for its inquiry into the Northside Storage Tunnel—Scott's Creek Vent.

Under Standing Order 252 of the Legislative Council, this Committee has resolved to authorise the media to broadcast sound and video excerpts of its public proceedings held today.

The Committee's resolution conforms with the guidelines governing the broadcast of proceedings adopted by the Legislative Council on 11 October 1994. The Attendant on duty has copies of these guidelines.

I emphasise that only members of the Committee and the witnesses before them may be filmed or recorded. People in the public gallery are not considered to be part of the proceedings and, therefore, should not be the primary focus of any filming or photographs.

In reporting the proceedings of this Committee, as with reporting the proceedings of both houses of Parliament, you must take responsibility for what you publish or what interpretation is placed on anything that is said before the Committee.

Members of the public: I wish to advise you that committees are regarded as extensions of the Legislative Council, governed for the most part in their proceedings by the same rules which prevail in the House.

While the Committee welcomes members of the public, you should observe the same courtesies as are expected of the public attending when the House is sitting.

Visitors in the public galleries are required to refrain from any interruption to proceedings or discourtesy to the Legislative Council, particularly any interjection or demonstration of support or dissent in relation to these proceedings.

There is an attendant on duty who will assist visitors. Should you have any particular requests, you should advise the attendant on duty.

COLIN JOESEPH WOODWARD, Executive Director, Sydney Region, New South Wales Environment Protection Authority, "Kingsley", Kendall Street, Thirlmere,

NICHOLAS GEORGE AGAPIDES, Manager, Area Assessments Unit, New South Wales Environment Protection Authority, Post Office Box A290, Sydney South,

WARREN GEORGE HICKS, Manager, Sydney Catchments, New South Wales Environment Protection Authority, 79 George Street, Parramatta, and

ROBERT ANDREW MARR, Senior Regional Operations Officer, New South Wales Environment Protection Authority, 79 George Street, Parramatta, sworn and examined:

CHAIR: Mr Woodward, in what capacity are you appearing before the Committee?

Mr WOODWARD: I am representing the Environment Protection Authority [EPA].

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr WOODWARD: I have received that.

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

Mr WOODWARD: I am.

CHAIR: Mr Agapides, in what capacity are you appearing before the Committee?

Mr AGAPIDES: As a representative of the New South Wales Environment Protection Authority.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr AGAPIDES: Yes.

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

Mr AGAPIDES: I actually have not seen them.

CHAIR: Mr Hicks, in what capacity are you appearing before the Committee?

Mr HICKS: As a representative of the EPA.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr HICKS: Yes.

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

Mr HICKS: I am.

CHAIR: Mr Marr, in what capacity are you appearing before the Committee?

Mr MARR: Representing the EPA.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr MARR: Yes.

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

Mr MARR: Yes.

CHAIR: Mr Agapides, are you now conversant with the terms of reference of this inquiry?

Mr AGAPIDES: I am now, thank you very much

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 accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you wish to make an opening statement?

Mr WOODWARD: Yes, I do, Mr Chairman. The EPA has provided a written submission to the inquiry, and I will speak briefly to that written submission. The EPA has a regulation role for Sydney Water and for the Northside tunnel project. Specifically the EPA's role has been to provide advice to the planning authority on appropriate environmental requirements for the project, and if that planning authority issues a consent, then the EPA would issue a licence consistent with the conditions of the planning authority.

As it turns out in this particular case, we are aware that the Minister for Urban Affairs and Planning has issued a consent and subsequently the EPA has issued a licence with conditions for the proposal. In issuing a licence, the EPA focuses primarily upon environmental outcomes that are required to be met by law and does that rather than necessarily specifying the actual technology that needs to be applied.

In providing advice to the Minister for Urban Affairs and Planning, the EPA stressed the need to satisfy community concerns regarding the design of the air vent filters, particularly at Scott's Creek, and these concerns were addressed in the conditions attached to the planning approval by the Minister for Urban Affairs and Planning in August 1999.

The EPA has issued a licence for the construction of the tunnel, and when the tunnel is in operation the licence will also need to regulate the operation of the tunnel as well. In the licence that was issued, the EPA did foreshadow operational requirements for the tunnel once it comes into operation, and these requirements include conditions that prohibit the emission of offensive odours from the vent. They specify that monitoring is required to be undertaken once the vent and the tunnel is in operation; they specify that all plant and equipment that is used by the licensee to conduct the activity must be maintained in a proper and efficient condition and must be operated in a proper and efficient manner.

In addition to the licence requirements, there are also requirements under the clean air regulations. One of those requirements relates to the emission of hydrogen sulphide gases. The clean air regulations require that the emission of hydrogen sulphide must not exceed 0.005 grams of hydrogen sulphide per cubic metre in any discharges from the vent. In order to determine whether those statutory requirements are able to be met, Sydney Water and its consultants had to conduct modelling, and that had to be assessed by the EPA and by others to determine whether we thought that that was appropriate to ensure that those requirements could be met.

Atmospheric dispersion modelling was used to assess the capability of the equipment to meet those statutory requirements. The odour dispersion modelling that was carried out indicated that offensive odours would not be permitted from the vent at Scott's Creek and, in addition to that, hydrogen sulphide dispersion modelling was carried out. There are no ambient hydrogen sulphide standards in New South Wales. However, the consultants did use in their assessment two indicators for odour. One was what is called odour units, which is a subjective measure of determining the amount of odour, and the other was emissions of hydrogen sulphide. They used as a criterion for design purposes two odour units and three micrograms per cubic metre of hydrogen sulphide emissions.

The EPA was satisfied that those criteria were satisfactory for use as design criteria for the project and, indeed, they would result in much more stringent emission rates than required under the clean air regulations that I referred to earlier on.

I should stress at this point that those criteria that I mentioned for the design purposes are guidelines or objectives, compared to the licence requirements which are statutory requirements that must be met by law. If the project commences and were to cause breaches of the EPA statutory requirements, then the EPA has a range of tools available to deal with that, which can be from statutory notices through to penalty notices which incur an on-the-spot fine through to tier-two prosecutions, which can be up to $250,000, right through to tier-one prosecutions, which can be up to $1 million and include gaol sentences as well. So there is a whole range of tools that the EPA has available if there are breaches.

However, the assessment of the EPA was that the project was approved on the basis that it was capable of operating without any breaches of the statutory requirements. In addition to that, the EPA has required in the licence, monitoring once the tunnel goes into operation and that monitoring requires continuous monitoring of hydrogen sulphide emissions and also further modelling of the emissions to compare those to the modelling that was used for the design purposes for the tunnel.

The EPA is of the view that the installation of the tunnel will lead to environmental and, from our advice, health improvements for the community at large. We believe that the reduction in the frequency and volume of sewage discharges to Scott's Creek, to Lane Cove River and to other locations in the Sydney Harbour catchment will greatly reduce the water pollution in those and also the risk of human health but, having said this, we recognise that the community maintains concerns about human health impacts from the emissions of the tunnel.

We do acknowledge, though, that New South Wales Health is the appropriate agency to deal with these concerns, and the EPA has been in regular liaison with New South Wales Health in regard to

these issues. New South Wales Health has indicated to the EPA that the public health risk from tunnel vent emissions is likely to be very low and that there is not a demonstrated need to actually monitor pathogenic-type emissions from the tunnel because the risk is low and also because there are no relevant standards for such emissions to air other than in sterile environments such as operating theatres.

On top of that, we are of the view that the controls that have been installed or proposed to be installed in this tunnel, such as the carbon filters, will further minimise any risk and that those are providing an additional degree of safeguard for any tunnel emissions as well. Essentially, that covers the submission by the EPA and we are willing to take any questions.

CHAIR: We received your submission at 9.35 this morning by fax, so we have not had a chance to read it yet, but I gather that you have covered most of the points in your speech this morning.

The Hon. A. B. MANSON: Mr Woodward, what does the EPA consider to be the benefits to Sydney Harbour from the building of the Northside Storage Tunnel? How will pollution in the harbour be affected?

Mr WOODWARD: Under the current sewerage system, when there is high rainfall events, there are sewer overflows into Scott's Creek, into Lane Cove River and into other areas which discharge into Sydney Harbour. Those discharges carry pathogens, nutrients and other organic matter into the harbour which cause an environmental problem for the ecology of the harbour and also a potential human health problem as well. The tunnel will capture those and will take them to the North Head Sewage Treatment Plant where the sewage will be treated and discharged to a much higher level.

The Hon. J. F. RYAN: I am particularly interested in your comments about microbiological issues. I understand the licence does not provide any requirements. It does not specify anything with regard to microbiological monitoring. Is that true?

Mr WOODWARD: That is true, yes.

The Hon. J. F. RYAN: You say here that "The EPA understands that NSW Health has considered both the potential for a risk to public health from tunnel vent emissions, and the utility of monitoring tunnel vent emissions for microorganisms. NSW Health has advised that the public health risk from the emissions is very low", so your advice in that regard is entirely from the Department of Health?

Mr WOODWARD: That is true.

The Hon. J. F. RYAN: In what form was the advice given to you from the Department of Health?

Mr WOODWARD: That was from a letter from the Director-General of the Department of Health to the Director-General of the EPA.

The Hon. J. F. RYAN: Would it be this letter, which is part of the DUAP report, the Director-General's report from DUAP, a letter from Stephen Corbett, Manager, Environmental Health Branch, to Andrew Wild, which consists of five paragraphs?

Mr WOODWARD: No, it is not that one. There is a separate letter.

The Hon. J. F. RYAN: Would the advice be more detailed than that?

Mr WOODWARD: I have not seen that particular letter.

The Hon. J. H. JOBLING: Could we see the letter and have it tabled?

The Hon. J. F. RYAN: Is it likely that the advice from New South Wales Health is any more detailed than a page like that?

Mr WOODWARD: No. In fact, the advice is largely quoted in our submission, the words that we have used in our submission.

The Hon. J. F. RYAN: But it is not much more than that? Essentially what you have got is a letter from the Department of Health indicating that it has no concerns?

Mr WOODWARD: That is correct. It is not substantially any more comprehensive than that. It is a one-page advice.

The Hon. J. F. RYAN: So there is not much documentation in a letter like that, is there?

Mr WOODWARD: They did not provide their documentation.

The Hon. J. F. RYAN: Are you aware that New South Wales Health only last week had a panel of experts meet to consult on one of the issues relating to the Legionella virus?

Mr WOODWARD: I had heard that in the last 24 hours, but I do not know the details of that.

The Hon. J. F. RYAN: Is that not an issue which might have been a consideration for monitoring or specifying conditions in a licence from the EPA?

Mr WOODWARD: The Department of Health at this stage has indicated that they still stand by the advice they have given us in relation to the EPA's licensing requirements.

The Hon. J. F. RYAN: Were you invited to hear the evidence that the Department of Health took in regard to the microbiological health issues?

Mr WOODWARD: No, I think it is important to realise that the EPA does not have medicos on its staff, so we do not try to become experts in this area. We do rely on the experts.

The Hon. J. F. RYAN: As the EPA does, do you think it not unreasonable that the Department of Health should publish its advice in a manner which can be scrutinised by yourselves, other departments, the community and DUAP?

Mr WOODWARD: I could not comment on that.

The Hon. A. B. MANSON: Again, Mr Woodward, you have explained in your contribution what the Scott's Creek vent does, but can you explain why the Scott's Creek vent is required? Could it have been another vent at another position? Why do we need a vent at Scott's Creek?

Mr HICKS: The current configuration of the tunnel requires venting, both during the stand-by mode and as the tunnel fills. During the stand-by mode and, I think, for maintenance modes as well, the gases in the tunnel are extracted and treated at North Head, but as the level of sewage diluted by stormwater rises in the storage tunnel, that access route to the North Head treatment facilities and discharge point is blocked with rising liquid and there is a need for the gases within the tunnel at the higher parts to be expelled as the liquid level rises and the tunnel fills.

As I say, the current configuration means that there is a blind end at Scott's Creek and, as the level rises, the gases that remain in the latter stages of filling need to be expelled from that end of the tunnel.

CHAIR: Mr Woodward, are you aware of the submission of Ralph Kaye Consulting, who alleges in his submission to the Committee that it would be impossible for the current design to meet the POEO [Protection of the Environment Operations] licence number issued by the EPA and condition E3.11 of that licence? He also says that the current design of the vent contravenes section 64 of the POEO Act. Can you comment on that at all?

Mr WOODWARD: If you could just bear with me for one second, please. Do you have the date of that letter?

CHAIR: It is a submission to the Committee, number 97, which should be available to you. If not, we will make it available to you. We can put the question on notice?

Mr WOODWARD: I have not seen submissions to this Committee.

CHAIR: We will put the question on notice and make sure that you get a copy of that submission so that you will be able to respond to it on notice. There are allegations by Mr Kaye, and perhaps others, that it will be impossible to meet conditions laid down by the EPA. They also add in their submission on page 7 that they do not believe that the carbon filter installed can achieve 50 odour units per cubic metre. Can you possibly comment on that?

Mr WOODWARD: I think we will have to take that one on notice.

The Hon. A. B. MANSON: Mr Woodward, can you tell me are there any odour licences required for odour at North Head Sewage Treatment Plant? How are these monitored and reported? Have there been any breaches of these licences at North Head Sewage Treatment Plant by Sydney Water?

Mr MARR: I can answer that one. There are conditions on the North Head licence which require Sydney Water to monitor hydrogen sulphide emissions, but there are no limits on that licence other than the regulation that is in the clean air regulations.

The Hon. A. B. MANSON: Have there been any breaches?

Mr MARR: There is no breach, because it is only a requirement to monitor.

The Hon. J. F. RYAN: There is nothing to breach.

Mr WOODWARD: If I could just clarify that, that was in relation to hydrogen sulphide. There is a statutory requirement under the Act that they are not to produce offensive odours from the sewage treatment plant.

The Hon. J. F. RYAN: How do you work out whether they have breached it?

Mr WOODWARD: The legislation actually specifies a definition for offensive odours.

The Hon. J. H. JOBLING: But, surely, on that basis, if you are looking at offensive odours and determining them, the determination of this is going to be totally individual and subjective, is it not?

Mr WOODWARD: It is subjective. The definition tries to capture the subjectivity of it, and it is a definition which, from memory, says offensive odours are odours which by the nature of their level, the quality of the odour, the strength, the time, are likely to be offensive to or to interfere unreasonably with the comfort or repose of persons, so it is a subjective odour, but it is one that is based on offensive noise, and that has been through the courts. The reason it is subjective is because, like noise, odour will be different to different people, and it is very difficult to put a number on it. If you put a number on it, some people may find that number satisfactory; others may find that it is not satisfactory.

The Hon. J. H. JOBLING: Mr Chairman, with respect, noise in decibels is a very measurable item. There are specific standards laid down by specialists in audiometry that deal with the effect on the human ear and with the distance from the spike and the emitting source of noise. You have said to us that there is no hydrogen sulphide standard in New South Wales; you have said to us that the offensive odour is subjective. Would you be suggesting to me that the reaction of a person who comes from the country and encounters a hydrogen sulphide smell is going to be of the same subjective nature to somebody who works all day in a sewage plant and is quite accustomed to the standard issuing of odour smells from a sewage plant? Is that what you are suggesting to me?

Mr WOODWARD: The courts normally take reasonableness into account when determining whether offensive odour or offensive noise provisions of the legislation are breached. Our legislation

does not apply to people who work in plants or employees; it only applies to people in the environment—residents and other members of the public.

The Hon. J. H. JOBLING: Could you tell me, then, how many prosecutions the EPA successfully launched in relation to offensive odours and particularly hydrogen sulphide?

Mr WOODWARD: The requirement for offensive odours has only recently been introduced into new legislation and there have been no prosecutions in relation to that new provision. Prior to that provision, in the old legislation there was an absolute provision that prevented any odours beyond the boundary, and there were many prosecutions taken by the EPA and formerly by the State Pollution Control Commission in relation to that previous provision.

The Hon. J. H. JOBLING: Okay. The answer to the question, as I understand it, under the current Act is nil. Can I put to you, then, the question, because you referred to North Head: how many complaints have you received around the North Head Sewage Treatment Plant about odours?

Mr MARR: Historically, there were many years ago but of recent years since they have installed control equipment, the number of complaints to the EPA have dropped down to pretty much zero.

The Hon. J. H. JOBLING: Pretty much zero means what, might I ask? Pretty much zero is a very interesting statement but what does it mean?

Mr MARR: I do not recall any complaints to the EPA that I am aware of since the new legislation has been in force.

The Hon. J. H. JOBLING: So as a definition of the EPA, could it reasonably be put that one might say that the environmental protection agency is the environmental regulator for the construction and operation of the Northside tunnel? Is that a fair description of your role?

Mr WOODWARD: Yes, we are certainly one of them. Whether we are the only one or not, I do not know, but we certainly are a regulator.

The Hon. J. H. JOBLING: I am just surprised you took so long because that is the leading line of your submission to the Committee.

The Hon. A. B. MANSON: The hydrogen sulphide gas levels are being monitored. Is it not possible to determine whether that odour meets statutory requirements and that is why there have probably been no prosecutions?

Mr MARR: That is true.

Mr WOODWARD: That is a reasonable assumption if they are meeting that. If they are monitoring it and the monitoring is showing that they are having low levels, that is probably the reason that they are not having odour complaints.

The Hon. J. H. JOBLING: If there is nothing there, you cannot complain, can you?

The Hon. J. R. JOHNSON: Mr Woodward, when you seek advice on any other public health issue from the Department of Health do you receive more than a letter and is it normal practice to receive written advice?

Mr WOODWARD: The EPA does not normally receive the detailed justifications that go behind advices from the Department of Health because, as I said, we are not medicos, so we do not have the expertise to technically assess those. In some cases we do not receive any advice because it may be there are Australian or internationally accepted standards that we can simply refer to that have been developed up by Australian or international health experts.

The Hon. J. F. RYAN: So who would then be responsible for making sure that the inquiries done by the Department of Health were rigorous enough, asked the right questions, did the right tests and applied the right standards?

Mr WOODWARD: New South Wales Health, I would expect.

The Hon. J. F. RYAN: They are a law to themselves.

Mr WOODWARD: Well, subject to Parliament.

The Hon. J. F. RYAN: We only got a letter too. Are you aware that the modelling you referred to earlier has one constraint, which was conceded yesterday by the person who carried it out, Ms Kerry Holmes, that the scrubber at North Head, which is designed to remove a greater level of hydrogen sulphide than the tower complex at Scott's Creek, has only been designed to operate with an output of 500 odour units guaranteed in its emissions, and yet the modelling at Scott's Creek requires that the emission targets will be met if that particular equipment meets a limit of 50 odour units per billion in hydrogen sulphide. In other words, the modelling of the Scott's Creek equipment is based on a standard which has not been achieved by more complex equipment at North Head?

Mr AGAPIDES: In answering that question, I guess that 50 odour units per cubic metre and the 50 ppb [parts per billion] of hydrogen sulphide that you refer to have been developed by taking into account the design criterion that Joe Woodward referred to in our submission, that is the two odour units and the three micrograms per cubic metre. Now, those criteria are based on a 99th percentile and the emission rates that you have referred to have been determined assuming a 100th percentile. Subsequent modelling, as I understand it, was carried out by Holmes Air Sciences using site representative meteorological data from Lindfield. It was not deemed to be absolutely suitable for the site, but that modelling in fact shows that at the 99th percentile, the levels of hydrogen sulphide and odour that could meet those design criteria would be higher than the numbers that you refer to, but I cannot recall how much higher.

CHAIR: Do you know that the surge waves in the Chicago tunnel due to rapid filling caused a pressure surge and resulted in iron gratings being blown off at several drop shafts? Are you aware that if this occurred in the Sydney tunnel it would result in the bypass of the Scott's Creek filters and release unfiltered air and gas?

Mr WOODWARD: I am not aware of that.

CHAIR: Were you consulted about the environmental impact of the removal of the vent at Tunks Park and Quakers Hat?

Mr MARR: I was aware that originally there was a plan to have a vent at Tunks Park. I was not aware that there was one at Quakers Hat Bay. But from my understanding it was because of other design changes that went on at the Tunks Park area that the requirement for that vent was removed. It was not necessary.

CHAIR: On the question of the bypass, if unfiltered air is vented from time to time will this not breach your licence conditions?

Mr WOODWARD: Our advice from Sydney Water is that it is not part of the design to have a bypass operating that would lead to unfiltered air.

CHAIR: There will be a bypass from time to time when the pressure builds up. The bypass is built into the system at Scott's Creek.

Mr WOODWARD: Our advice is that that would not be operational, and that is not catered for in the EPA's licence.

The Hon. J. R. JOHNSON: Gentlemen, what conditions does the EPA put in place to respond to the community's concerns about the Northside Storage Tunnel, for example, licensing

conditions for air emissions and water quality? Can the EPA assure the community that it will protect the environment?

Mr WOODWARD: The EPA has been very concerned to engage with the local community during the development of this proposal acknowledging that the EPA's role is to in fact assess whether the proposal can meet the environmental requirements, so the EPA has been going along to community meetings and advising the community and listening to the community's concerns regarding the proposal. The EPA's licence and its determinations are available to the public via a public register, and any licensing action that the EPA takes in relation to changed licence conditions or penalty notices or prosecutions is all available to the public as well.

CHAIR: The wording of the POEO licence conditions controlling the environmental impacts 08.1 and E3.1.1 appear to be essentially identical with condition 51B of the consent by the Minister for Urban Affairs and Planning for this project. Are the POEO licence conditions based on condition 51B?

Mr WOODWARD: I think it is probably the other way round in that the EPA provided advice to the consent authority of appropriate environmental requirements that we thought were necessary. Those were then included in the consent and they were reflected in the EPA's licence as well, so there was a consistency through the process.

The Hon. J. F. RYAN: There are some issues relating to the provisions of the Protection of the Environmental Operations Act, in particular section 45. Is the EPA in contravention of that Act if it does not set specific measurable emission limits for odour and hydrogen sulphide at Scott's Creek?

Mr WOODWARD: I would have to have a look at section 45, unless you can read it out, to answer that question.

The Hon. A. B. MANSON: Mr Woodward, how does the EPA include air quality measurements in their licence for the Scott's Creek vent?

The Hon. J. F. RYAN: I had not finished, Mr Chairman.

The Hon. J. R. JOHNSON: Neither had we.

Mr WOODWARD: Sorry, could I have the question again, please?

The Hon. A. B. MANSON: Yes. How does the EPA include air quality measurements in their licence for the Scott's Creek vent?

Mr WOODWARD: The EPA has included a requirement for continuous hydrogen sulphide monitoring and also for compliance modelling for the hydrogen sulphide and odour units once the tunnel is in operation to check the compliance against the design of the tunnel.

The Hon. J. H. JOBLING: This is in the vent. Is it ambient air? Is it in the tunnel? Is it at the vents where the activated carbon is, prior to the vents or after the vents? Where and what are you actually monitoring?

Mr WOODWARD: The hydrogen sulphide emissions will be monitored as the final emissions from the vent.

The Hon. J. H. JOBLING: That is the exit side of the vent?

Mr WOODWARD: Yes. The modelling takes into account the emissions and also the ground level concentration, so it takes into account the impact out in the ambient environment.

The Hon. J. H. JOBLING: But the only measuring place is on the exit side of the activated charcoal filters on the vent?

Mr WOODWARD: Yes, that is correct.

The Hon. J. F. RYAN: I take it that you will take on notice that part of the question that relates to the POEO Act, but is there not a requirement under that Act to consult with the community before you issue a licence like that which you have issued for the Scott's Creek exhaust, and did you consult with the community and, if you did not, why not?

Mr WOODWARD: There is not a requirement under the legislation for the EPA to consult with the community prior to issuing a licence. In fact, the legislation requires the planning consent authority to consider public submissions through the planning consent process and the EPA needs to consider those public submissions in providing its advice to the planning consent authority, and when the planning consent authority has made a determination, then the public has already been involved in the decision-making process from there, so there is not a duplication of public involvement in the EPA's licence-setting process that follows that. So the public does have an opportunity to be involved in the process, but only once, not twice.

The Hon. J. H. JOBLING: If there is a monitoring event that occurs, there is a discharge of hydrogen sulphide, it would seem to me that as an authority you would then investigate it after the event. How do you go about doing that? How long after the event, and is this not almost like the morning-after-the-night-before-pill treatment?

Mr WOODWARD: The whole purpose of having the inquiry and the assessment in the first place and the Waterways panel set up by the Government is to try to ensure that whatever is approved is not going to cause a problem down the track. So that whole process was aimed at preventing a problem. We cannot ignore the fact that problems may occur.

The Hon. J. H. JOBLING: What I am dealing with is that the problem has occurred. Now, what do you do?

Mr WOODWARD: If a problem does occur, then the EPA does investigate it. In fact, the EPA has published prosecution guidelines that are publicly available which outline the way the EPA will investigate and take into account the prosecution action that the EPA may take. As I mentioned at the beginning, the EPA has a range of tools that may be—

The Hon. J. H. JOBLING: What I am looking to find from you is how you can assure the residents that you will act promptly, how they will know you are acting and how they will be able to monitor what you are doing. The residents are nervous.

Mr WOODWARD: Well, the EPA would rely on its track record. We have an extensive record in terms of prosecutions and we have prosecuted Sydney Water for environmental breaches. We have more prosecutions than any other environment agency in New South Wales. As I said, that is one of our tools.

(The witnesses withdrew)

MAXWELL GEOFFREY NOONAN, Director, Development and Infrastructure Assessment Branch, Department of Urban Affairs and Planning, Governor Macquarie Tower, 1 Farrer Place, Circular Quay, and

EUGENE NEVILLE OSBORNE, Assistant Director, Development and Infrastructure Assessment, Department of Urban Affairs and Planning, 1 Farrer Place, Sydney, affirmed and examined:

CHAIR: Mr Noonan, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr NOONAN: I did.

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

Mr NOONAN: I am.

CHAIR: Mr Osborne, did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr OSBORNE: Yes.

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

Mr OSBORNE: 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 will accede to your request and resolve into private session. But I should warn you that the Parliament may override that decision at any time and make your evidence public. Would you like to make an opening statement?

Mr NOONAN: Thank you, Mr Chairman, I would. We have made a submission to you and that submission is limited in its focus to the application from Sydney Water last year for the modification to the tunnel to change construction at the vent at Scott's Creek in particular.

The papers we provided to you included the assessment report we prepared for the Minister to consider, when he made the decision, the independent air quality risk analysis that we had commissioned by a Victorian consultant and the conditions that the Minister imposed on Sydney Water when he issued the approval. All of these were made publicly available in 1999 and all are on the Internet. I am aware of no further critical documents that have not been made public.

In this presentation, though, there are three quick points I would like to draw to your attention. Firstly, the branch that we have has, as its sole obligation, to do independent and objective evaluations of all proposals that come before the Minister. We have a multidisciplinary group and we do call in individual expert outsiders when needed to supplement that.

In this case, the group challenged the proposal to modify the vent as proposed by Sydney Water and we conducted what I consider a quite thorough risk analysis that started from the premise that the vent would cause problems in the local area. The risk analysis, therefore, tried to confirm or reject that assumption and, if there were problems, to weight the significance. Then if they persisted, to devise conditions that the Minister could impose on Sydney Water to reduce their effect.

The second point: we became very aware early in the considerations that the community had considerable disquiet about the risk that the vent would present to the area and to the school in particular. That became a very strong focus of our evaluation, and you will find in our submission we have dwelled on the infectious diseases risk that the community was concerned about.

In doing that analysis, we came to the conclusion quite early that there was no reliable quantitative data that would describe that infectious diseases risk. That is in the global literature. We did quite a search and there are a number of reasons for that that the submission discusses, so we based

our risk analysis on a qualitative model. We went through a logical framework, and that is the basis of the recommendation to the Minister.

The final point is that we concluded that the risk was low but it would be low if sophisticated technologies and management systems were put in place. The conditions demand that the design and operation of the vent be conducted in a certain fashion, and that fashion is different from what was described in the REF [Review of Environmental Factors] released by Sydney Water to the community, but we ratcheted up the requirements quite significantly. With that in mind we, therefore, have emphasised that safety in the area will be very heavily dependent upon Sydney Water's diligent management of that system long term.

We have in place a requirement for a series of operational plans that we will be approving very specifically for Sydney Water on how the technologies will be implemented and maintained long term. I emphasise that, whilst we did a lot of work in the assessment, the fun has only just started. It is going to be from now on that the effort will be required to make the system work. There are other points, but knowing your time constraints, I am happy to take questions.

The Hon. A. B. MANSON: Mr Noonan, from previous evidence and on the results of the assessment, it seems that the tunnel will only operate for about 30 days per year. What are the risks to the school if the tunnel is used more than those 30 days per year?

Mr NOONAN: Firstly, that was a critical part of our risk assessment, that it is a short-term operational system and, if I can elaborate, 30 of those days may be weekends when there is no one on the school grounds. However, if you had a very rainy season, I think it is a dual-edged sword, actually. On one hand, the carbon filters that are critical to the barrier will degrade more rapidly because hypothetically you have got more sulphide, et cetera, pouring from the sewer system into the filter block.

Therefore, the testing regime for Sydney Water would need to be, I will use the term, more rigorous—in other words, they will have to make sure they are watching the filters very carefully when they take these samples of sulphide levels, et cetera, because that will determine the efficiency of the filters. I guess the other side, though, is that if it is heavy rainfall the sewage would be more dilute, so hazardous infectious viral particles are going to be less prevalent in the sewage flowing past, so you could argue that the risk is reduced.

Now, what the trade-off is between those two factors I do not know, and it may be a factor of the actual rainfall event. But if you had an El Niño where rain is pouring through the city, you would have very dilute water going through, and what is more, there is another factor, that in slow flowing sewage, the organic matter will deteriorate under biological degradation, and that allows other organics to go into the filter as well, so you have got two for and one against if you do have a very rainy season where the filter are under heavy demand.

CHAIR: In your report to the Waterways Advisory Panel, you stated in paragraph 3 that if a heavy load of infective particles were to travel through the vent it would have to pass through two vents of activated carbon placed in line. Were you aware that there are three vents of activated carbon placed in parallel and that the air will be filtered only once? Does that affect your report?

Mr NOONAN: I was under the impression that the carbon beds would be doubled. If you say that the current circumstance is that that is not occurring, then I do have to go back, and I will have to come back and advise you separately, because I was under the impression when we negotiated with the commission that we negotiated a double layer.

CHAIR: Are you also concerned about the possibility of Legionella breeding within the carbon filters?

Mr NOONAN: Yes, it was addressed, Mr Chairman, and there is an assumption that the carbon bed layers, the double layers that I have referred to, would stop bacterial cells going through. Again, it comes back to a rigorous management of those filters—in other words, they are taken off line and cleaned. So the question becomes what is the critical mass of bacterial accumulation in the system that would go past the threshold to allow release, and if the filters were poorly maintained I would

speculate that they would be a colonised bed that would allow Legionella release, so we talk about a regime that requires monitoring of those beds.

CHAIR: What kind of filters are you led to believe are being used, or what type of carbon is being used in your understanding?

Mr NOONAN: Specific impregnated activated carbon that is chosen commercially to suit those circumstances of high humidity. There is a range of carbon beds on the market and there is one particular type that suits the circumstances of a sewage vent. I am sorry, I cannot quote the commercial name and the chemical structure, but Frank Fleer, who was the Victorian we had do the work, specifically sought out the type of carbon for that circumstance for us.

CHAIR: Are you aware that the carbon filter will have to operate in humid conditions?

Mr NOONAN: That is the condition, yes.

CHAIR: Under those conditions, then, the filter would not remove VOCs [volatile organic compounds] and pathogens?

Mr NOONAN: The impregnated activated carbon that we are talking about would be the type selected specifically for those humid conditions. It would function under those conditions. Not all activated carbon beds would, correct.

CHAIR: Under those conditions, then, they would not actually remove VOCs and pathogens like Legionella, would they, if it was wet carbon rather than dry carbon?

Mr NOONAN: No, sorry, I believe the type of carbon we are specifying will remove the VOCs. It will be effective in the humid conditions of the tunnel.

The Hon. J. F. RYAN: Are you saying that you have information that indicates that activated carbon will remove infectious organisms?

Mr NOONAN: Yes.

The Hon. J. F. RYAN: As I understand it, Sydney Water will not give that guarantee. They said it is very effective for chemicals, but nobody has given this Committee evidence that activated carbon is guaranteed as a protective mechanism for filtering out infectious organisms.

Mr NOONAN: I guess I can state the assumptions we have worked under, that commercially this stuff is provided. It is used in hospital systems; it is used for this purpose. It is considered, by the way, to be the most effective microbiological removing substance both for bacteria and viruses, which are totally different things.

The Hon. J. F. RYAN: It is a fairly critical point for the Committee. Are you able to provide some documentation as to the source of your information in that regard because yours has been the only department or agency that has given evidence to that effect. It has been said by other witnesses, to be truthful, that they may provide some barrier, but they have not suggested that activated carbon was used in the fashion that it has any sort of industrial guarantee, for example, of being able to provide that level of protection for, say, viruses such as Legionella. Are you aware that the Department of Health has in fact conducted further inquiries about whether the carbon filters will be effective as a barrier against Legionella.

CHAIR: Just last week.

Mr NOONAN: Two points, Mr Chairman. Certainly I would be pleased to get extra information. The other thing is that in the papers we provided, the report by Frank Fleer does discuss this. If I could refer you in the interim to his analysis in that report, that was very influential in our decision, but I can get you commercial literature.

The Hon. J. F. RYAN: Of particular importance to us will be whether or not the carbon filter manufacturers themselves provide those guarantees for pathogens.

CHAIR: The evidence we have had so far does not indicate that the filters are designed or will remove VOCs so it is unusual that you should have evidence directly opposite to that.

The Hon. J. H. JOBLING: Surely, Chairman, the moisture and humidity conditions in which the carbon filters are operating are going to be of critical importance. If the filters are heavily laden with moisture, their efficiency decreases. Second, would you not have to agree that the removal of pathogens—this is outside the acidic gases—seriously depends on the type of pathogen involved and the particle size of the pathogen?

Mr NOONAN: I would agree that the particle size is critical but the type is a different story because some are charged and some are not. But most viral particles, for instance, which are a thousandth the size of bacteria—

The Hon. J. H. JOBLING: They are very small, are not they?

Mr NOONAN: That is right—rarely travel alone. They will attach to dust particles, aerosol droplets, organic material. A virus just does not distribute; it is just too tiny.

The Hon. J. H. JOBLING: I accept that, but if there is any moisture within the carbon filters, even impregnated carbon, as has now been moved to from the ordinary carbon first of all proposed, surely the basis of the carbon filters and the designation of the modelling was done on the basis that they were there to remove odour. Would you not agree that that is the principle that they were put there for in the first place?

Mr NOONAN: I would present it to you that we saw it as a double-barrelled barrier—in other words, it was a barrier that sought to stop odour escape but it was also going to be equally efficient in removing infectious agents.

The Hon. J. H. JOBLING: It is an adsorption method?

Mr NOONAN: It is adsorption, correct.

The Hon. J. H. JOBLING: Which must be clearly understood. It is not absorption; it is adsorption.

Mr NOONAN: Correct..

The Hon. J. H. JOBLING: And, therefore, as you said, anything can then go through it. If it were to pass—what would you suggest—80 per cent efficiency, there would be a major danger?

Mr NOONAN: That is right, and that is why we required sampling of the beds by Sydney Water of the sulphide levels as an indicator of the level of saturation of those beds.

The Hon. J. F. RYAN: Would that be an adequate indicator of their microbiological content?

Mr NOONAN: No, it would be an indicator only of their efficiency of removal. In other words, it will not be looking to find out what is in them or what might have gone out. It will only say whether that carbon bed is working or not. Now, the 85 per cent level should have a redundancy built into it—in other words, they should failsafe 50 per cent—so we have gone for a conservative approach to that.

The Hon. J. H. JOBLING: Just as a matter of interest, on the assumption that Sydney Water fell down in its rigorous testing process, what other means and agencies will be overviewing and testing these filters outside Sydney Water or a major incident causing some problems that would bring you in?

Mr NOONAN: Two layers, Mr Chairman. The first layer says they will be required to provide to us periodically, almost regularly, reports of maintenance regimes put in place that will include what they have done with those filters. In other words, if they have missed a maintenance, it will come up in our review of our plans, and of the multiple projects we have in the State, we are going through those plans periodically.

The Hon. J. H. JOBLING: How long after would that happen—a month, two months, three months?

Mr NOONAN: It will be some months, for the first one at least?

Mr OSBORNE: There will be requirements for environmental audit.

The Hon. J. H. JOBLING: That is every six months?

Mr OSBORNE: The director-general can require that at other intervals as well.

The Hon. J. H. JOBLING: You see what I am getting at. If it is six months and the date goes past, you could have six months of emissions that are totally out of control and you do not know anything about it.

Mr OSBORNE: The other thing I might just mention is that the conditions do require the emission sampling program be submitted to the EPA for its approval, so the EPA also has that power to set the particular timetable.

The Hon. J. H. JOBLING: But in both cases there is a considerable possibility that if somebody failed in their duty of maintenance it could lead us into that situation?

Mr NOONAN: I do believe that is the case. I think, as I said at the outset, the rigorous maintenance regime is a critical part of that barrier.

The Hon. A. B. MANSON: Mr Noonan, could you give the Committee more details concerning the risk assessment you undertook?

Mr NOONAN: Yes, the process we went through, I guess, was two to three-layered. We started off bringing in the engineering air quality expert firm to write for us, I guess, the framework of what were the options, and this is where they chose the barrier approach as the most appropriate. Once we had that, we identified what we considered the vulnerable spots in the whole process. We then went back and challenged Sydney Water at a meeting with the Alliance. As I recall it, there would have been 15 to 20 people around the table for four hours where we methodically went through every line of his analysis and came to what we considered was a suitable compromise. There had been other meetings but this was probably the critical one.

The Hon. J. F. RYAN: Is this Mr Fleer's report?

Mr NOONAN: That is right. That is attached to the papers.

CHAIR: How many prosecutions has DUAP launched in the last two years for breach of conditions?

The Hon. JAN BURNSWOODS: I do not know that he has finished. He was interrupted.

CHAIR: I am sorry, I beg your pardon.

Mr NOONAN: Once we had, I guess, the approach needed we then sat down to do the classic risk paradigm that is reported in our submission, and that is going through the logic algorithm, of where would the threats be and how would you mitigate them. We had the draft. We discussed that with the community; we discussed that with independent experts. But verbally there are not records of these. We spoke to the University of New South Wales Centre for Wastewater Research to check out whether there was additional literature, to check out whether the risk model was consistent. All we continually

got back was that there was no alternative; nobody had problems with what we were doing as opposed to we should be doing something else. With that in mind, we put the model up to the Minister saying that it is qualitative, it is subjective but it appears to be the only one we can come up with at this time. We wrote to the Department of Health and presented to them and asked for formal endorsement, and we have that in writing.

CHAIR: How many prosecutions has DUAP launched for breach of conditions in the last two years?

Mr NOONAN: Within our branch, Mr Chairman—I cannot comment organisation-wide but we are the major industry branch, the major projects branch—I would argue one that I know of on a coalmine. It is not our normal process. We do not follow a prosecution process. We tend to seek to stop work, mitigate and correct rather than prosecute.

CHAIR: The Hon. J. R. Johnson?

The Hon. J. F. RYAN: Can I just ask for detail?

The Hon. J. R. JOHNSON: This is John Johnson; this is John Ryan.

The Hon. J. F. RYAN: It is just that it will help this make sense. Is the Northside Storage Tunnel Lane Cove and Scott's Creek vent—

The Hon. A. B. MANSON: Are we going to get a fair go today or not?

The Hon. JAN BURNSWOODS: It is a clarification.

The Hon. J. F. RYAN: It is a clarification. Would you mind?

The Hon. A. B. MANSON: You have interrupted us on a dozen occasions.

The Hon. J. F. RYAN: And the question would have been asked and answered in the time it took you to complain about it. Is that document the Fleer report?

Mr NOONAN: I believe so. It is Air Water Noise Consultants. My apologies. I did not realise.

The Hon. J. H. JOBLING: For the record, that is it.

The Hon. J. H. JOBLING: Why did DUAP not insist on a full EIS [environmental impact statement] for the modifications for the original approval?

Mr NOONAN: Mr Chairman, if I may ask Neville Osborne to comment, it would be best.

Mr OSBORNE: Under the Environmental Planning and Assessment Act the principal obligation to determine whether an EIS is required for modification rests with the planners, in this case Sydney Water. Sydney Water had to go through a two-stage process. Firstly, they had to determine whether the change of proposed modification was inconsistent with the Minister's original approval and, if so, they would then need to seek the Minister's approval. If that were the case, they would then need to determine whether it required an EIS or not.

Sydney Water decided in the first case they would seek a modification following discussions with the department, and in the second case they did an assessment of the changes between the approved proposal as it would be after the modifications and concluded that it would not be likely to have a significant effect on the environment. The department reviewed that issue.

The Hon. J. R. JOHNSON: That is your department?

Mr OSBORNE: Yes, the Department of Urban Affairs and Planning in its assessment report to the Minister. It looked at that issue and concluded that the changed impacts would not be significant

providing an appropriate management and monitoring regime was put in place, and through that we required that an operational environmental management plan [OEMP] be approved prior to the commencement of operation.

The Hon. J. F. RYAN: In this Fleer report, reference is made to a list of 94 activated carbon-based data control systems in the United States serving sewage pump stations and sewage treatment plants which was provided by the NSTA. Time constraints prevented contact with a list of systems operators to establish operating experience. Were you aware or was the department aware that, apparently, there is an activated carbon filter in use by Sydney Water itself at their Padstow and Hoxton Park sewage pumping stations? Do you agree that information from there might have been highly relevant in terms of the performance of activated carbon infiltration?

Mr NOONAN: I think the easy answer is to say yes, but I am going to go for a no. We sat down and looked at the circumstances specifically faced at Scott's Creek, the design of the vent, the humidity conditions, and the meteorological conditions. Our question to Fleer was what is the right approach for there. There are many activated carbon systems around we could have looked at for data, but that was the one he was specifically chartered to come up with a recommendation. He was in New York and he did speak to the Americans during this exercise and he has given us a recommendation on which types, which I will come back to you on.

The Hon. J. F. RYAN: What is mercaptan removal efficiency?

Mr NOONAN: It is an organic compound that stinks. Sorry, it would be the percentage of an air flow that would be taken out—in others words, if 100 per cent went through as opposed to 1 per cent went through—so the removal efficiency is the capacity of the system to take it out of the flow.

CHAIR: Does the emission of a performance guarantee from the mercaptan contravene condition 10?

Mr NOONAN: I do not believe it does because I believe that system will remove the VOCs [volatile organic compounds] and compound odours like mercaptans. I need to refer back to the Fleer report to confirm that, but we have worked under the assumption that those beds will be effective in that odour removal.

CHAIR: And if you are wrong?

Mr NOONAN: Then I will have to come back to you with a statement that qualifies that.

The Hon. A. B. MANSON: Mr Noonan, obviously the community is very concerned about this vent. How can your department guarantee the community that the controls to the vent will be fully implemented and maintained?

Mr NOONAN: The conditions were specifically written to regard the Scott's Creek vent as a high risk circumstance. We have many approvals, but this one we classify as a high risk activity. Therefore, Sydney Water is required to prepare, as I said before, an almost constant flow of data and reports on performance that we do send to other relevant agencies, in particular the air quality monitoring expertise in the EPA to review as well.

In other words, when we determine an activity to be higher risk, it then goes under our microscope and we have computer-based tracking systems that follow up within a week if those reports do not arrive on our desk. Those reports are public. Once they hit our desk they are available to the community to scrutinise as well.

The Hon. A. B. MANSON: Mr Noonan, yesterday we heard about the flushing of the tunnel. We heard about ponding in the roof of the tunnel. What is your understanding of flushing? Do you understand how the tunnel is to be flushed?

Mr NOONAN: I have a perception. I would like to ask Neville's view as well, if you do not mind.

Mr OSBORNE: I understand it will be flushed through a high pressure velocity of raw sewage at the start of another event. That is my understanding.

The Hon. A. B. MANSON: Is there any chance that ponding could happen in the roof of the tunnel and lead to the build up of bacteria?

Mr OSBORNE: I do not understand how it could happen in the roof.

The Hon. A. B. MANSON: I do not understand, either. The question was asked yesterday. I would like clarification of that.

The Hon. J. F. RYAN: The roof would be wet and slimy, I would imagine.

Mr NOONAN: You are saying it would not dry out under normal circumstances?

The Hon. J. F. RYAN: It was not dry when we visited it. It was pretty wet to us.

Mr NOONAN: From my perspective, Mr Chairman, the worst case would be that that organic material would degrade under microbiological normal processes and that would be to the mercaptans, microorganisms, et cetera.

The Hon. J. H. JOBLING: In answer to Mr Manson you said that on flushing of the tunnel it would be flushed by raw sewage at the next event.

Mr OSBORNE: The release of raw sewage.

The Hon. J. H. JOBLING: So, in other words, whatever is in there, as the tunnel dries slowly, all remains in pondings, rough cracks at the bottom or adhering to parts of the sandstone would remain in the tunnel and degrade until the next time the tunnel is filled and flushed in totality; is that what are you saying to me?

Mr OSBORNE: I do not know what would actually remain. My understanding is that there will be concrete lining of the actual floor which should reduce ponding.

The Hon. J. H. JOBLING: Are you sure of that?

The Hon. J. F. RYAN: I think the concrete liner went a long time ago.

Mr OSBORNE: Yes, you are right. In terms of the issue with the environmental factors, we did talk about removing the invert, but more recently Sydney Water has advised me that it will be lined on the floor.

The Hon. J. H. JOBLING: So outside that, the only way of flushing the tunnel is waiting for the next incident for it to fill and then the raw sewage going out after it has filled is the only way it is going to flush? There is no other means of flushing the tunnel?

Mr OSBORNE: I do not know whether there are any other means. There may well be other means, but my understanding is that the current proposal is to do it that way.

The Hon. J. H. JOBLING: Obviously you will have sought advice from various government bodies and instrumentalities in working out your development conditions. Could you tell me when, perhaps, you first approached New South Wales Health for its advice on matters relating to the tunnel and the vent?

Mr NOONAN: If I may, we approached the Department of Health after we had formulated our own view. In other words, we went through the process I described before, formed the view and then sent that to the Department of Health and sought their endorsement for it. We did not work with them beforehand. We sought that advice in writing. We have a letter from the Director-General of Health endorsing our approach.

The Hon. J. H. JOBLING: So, you had the ability to approach experts in the health field to come to that conclusion to satisfy New South Wales Health?

Mr NOONAN: Yes.

CHAIR: You said that 30 days operation of the vent would be considered as a short period of time. Could not a catastrophic event occur in one day?

Mr NOONAN: Most certainly, and that has happened, to my recollection, a few times in the last decade. My argument, though, is that if that were to occur, you are dealing with a large volume of almost pure water. In other words, a very large flow comes through where the sewage is a minor component.

CHAIR: If it is almost pure water, how come you get so much paper and other matter hanging from the branches of trees during overflow events?

Mr NOONAN: Maybe if I can qualify the term "pure water". Stormwater is actually quite grotty in the first wave. What happens, as I understand it, when you get the paper and sewage residue is that when it comes out, it washes the stuff straight out of the sewage system that has been there before or the last slow flow. When a very large slug of water comes down, for the debate we have having about the vent, the vent would be facing very diluted water at that point compared to the normal daily flow of sewage.

The Hon. A. B. MANSON: Would there not be raw sewage stored in the tunnel for any long period of time?

Mr NOONAN: I cannot comment, I am sorry. I know there has been a debate over the last three years as to how the tunnel would be used as storage. I really must refer back to Sydney Water on what their plans are on that.

The Hon. J. H. JOBLING: Did you place any conditions on the use of the tunnel under such circumstances in the event of a plant failure at North Head and they wished to store fresh raw sewage back into the tunnel?

Mr OSBORNE: I believe it is an issue that the operational and environmental plan will cover.

The Hon. J. H. JOBLING: You have given it no consideration?

Mr NOONAN: No. Incidentally, the title of the tunnel is the Northside Storage Tunnel. The signal has been given to us strongly that that is the objective of the tunnel. I cannot comment on Sydney Water's operational intention. We are just in the process now of receiving the operational plan, and that will be reviewed over the next three weeks.

The Hon. J. H. JOBLING: Did your plan also make it very clear that this could not later be hooked up and become part of the operating sewerage mains system?

Mr OSBORNE: I think the important thing to note is that what the proposal is for, as described in the EIS and the Minister's approval, is for the proposal as put forward, subject to a number of conditions.

The Hon. J. H. JOBLING: Just to clarify the answer, the answer was that no, you did not consider the matter, therefore, it is not dealt with in the approval?

Mr NOONAN: Correct.

CHAIR: If Legionella has been breeding quietly in the filters over several months and there is a heavy storm event and then the tunnel fills rapidly, is it not possible for the air which has been forced through at quite a rapid rate to force all those Legionella bacteria into a very large cloud around the community?

The Hon. J. R. JOHNSON: it has not been established that there is Legionella bacteria.

CHAIR: There is some doubt about that. Does that possibility concern you?

Mr NOONAN: Again, when we discussed Legionella at the time, it was the normal sources risk of it being there that actually fed into our analysis. Filters are often, you are quite correct, a source of Legionella growth if it has the right organic material to proliferate. This type of filter was not seen to be the sort of circumstance that would be at risk. That comes from the chance that Legionella, which is a respiratory bacteria, would be present in the sewage, a very low chance, it would need an external source of bacterium to the filter.

The most significant cases, for instance, have been at construction sites where dust has been disturbed, potting mixture, Legionella longbeachae, et cetera. It fitted very low in our risk profile and that is one of the things we did confer with Health, as to whether they saw this filter would be a Legionella risk. They have advised that it would not be.

The Hon. J. F. RYAN: This report here described as attachment B includes the sentence, "Properly designed and managed activated carbon remains one of the most efficient methods for filtering out most types of particles and is actually used in protective measures against the filtering of infectious organisms in laboratory." That sentence appears to be based on some sort of advice. I just point out to you that that sentence or anything like it does not appear in the Fleer report at all. Where does that advice come from?

Mr NOONAN: As we said, we worked on the development of our risk analysis assessment over a period of three months. These were discussions, with various university departments testing out a model. If that statement is fundamental, then it is up to me to tell you which hospital lab it is in.

(Short adjournment)

(The witnesses withdrew)

RALPH BERNARD KAYE, Air Pollution Consultant, 4 Septimus Street, Chatswood, affirmed and examined:

CHAIR: In what capacity are you appearing before the Committee?

Mr KAYE: I am representing the Glenaeon School in the capacity of a consultant.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr KAYE: I did.

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

Mr KAYE: 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 would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you wish to make an opening statement?

Mr KAYE: Yes, I do.

CHAIR: Please go ahead.

Mr KAYE: The Northside tunnel is a major project which has highly publicised environmental objectives. The decision to vent the tunnel into the Scott's Creek valley has been controversial and there is a substantial history of community objection. The Scott's Creek valley is located in a harbourside bushland reserve. This is a sheltered valley, which is likely to experience poor dispersion conditions. The vent is situated immediately adjacent to a designated walking track, a school and residences.

On consideration of these matters, the project, which DUAP considers a high risk activity, should have been subjected to the most rigorous air quality investigations. However, this was not done, and substantial issues were not addressed. These issues are the failure of the project to control the transmission of potentially infectious aerosols, the failure of the project to guarantee compliance with the EPA's air quality goal for hydrogen sulphide and the absolutely certain failure of the project to comply with the EPA's air quality goal for odour.

I will now address these issues in more detail. Infectious aerosols are a substantial issue for this project, and I will address this first. Based on my own observations of similar facilities, the air from the tunnel will be humid and water will condense on the activated carbon filter. This was a problem that was also foreshadowed by Mr Frank Fleer, who was appointed by the Department of Urban Affairs and Planning as its independent consultant during the environmental statement process.

From my own observations, substantial quantities of aerosol water are discharged from activated carbon filters in these situations. At one installation the amount of aerosol discharge from the vent stack was sufficient to fill the sampling lines and to make the monitoring equipment inoperative.

Activated carbon filters have been in operation at two of Sydney Water's own sewage pumping stations since January 1999. However, neither the Alliance nor its consultants disclosed this information to the department or to Mr Fleer for further evaluation during the environmental assessment process. When the system is operated, potentially infectious aerosols would be created. The aerosols will have the ability to transmit pathogens to the school, to the nearby residences and to the adjacent bushland walking track.

These risks were not previously identified and cannot be quantified based on the Alliance's investigations. However, the risks are significant enough now to be acknowledged by the Health Department. Dr Stephen Corbett gave evidence yesterday. He confirmed that the formation of aerosols

was a substantial issue. He said there would be no significant health risk if no aerosols were discharged. The corollary must be that if aerosols are discharged there is, prima facie, a significant health risk.

Based on my own direct observation, there will be a substantial discharge of aerosols. Professor Charles Kerr also gave evidence yesterday. He said that biological films and slimes would encourage the growth of Legionella bacteria. Furthermore, based on his evidence yesterday and the written advice prepared by him previously, the sewage aerosols from the tunnel will most certainly inoculate the activated carbon filter with Legionella bacteria and other pathogens.

Based on recent advice from two Australian activated carbon suppliers, the moisture that condenses in activated carbon filters will contribute to the growth of biological films. In a personal communication on 23 May, Mr Peter Cullum, the Sales Engineer for Pica Carbon, confirmed that biological films always grow in activated carbon filters used for sewerage applications regardless of chemical impregnation. Mr Cullum observed that, prima facie, potassium hydroxide impregnation should prevent biological growth but in practice it did not.

Mr Cullum elaborated on the mechanisms for biological growth in impregnated activated carbon. He also confirmed that aerosols would very definitely be created in the activated carbon bed particularly for intermittently operated systems.

In a personal communication on 26 May, Mr Jerry Perara, the Technical Manager of Hycarb, independently corroborated that biological films would grow in activated carbon filters regardless of chemical impregnation. He also confirmed that free water condensed in activated carbon filters and that aerosols could be formed during operation. There is some confusion about emission limits.

I would now like to clarify this matter. Ms Kerry Holmes gave evidence yesterday. She said that the project did not need to comply with quantitative ambient air quality goals at Scott's Creek because the emission was intermittent. She said that the EPA had required her to undertake modelling for some unspecified purpose. She said the purpose was not necessarily to determine an upper limit for the emission. Because of the late hour she was not able to say what the actual purpose of the modelling was. It was put to Ms Holmes that in her modelling she had underestimated the odour concentration in the emission by a factor of 10. She said this was of no consequence because quantitative design standards were not needed for this project.

Ms Holmes' verbal evidence is contradictory. She said there are no quantitative standards, yet Ms Holmes also said that she determined by modelling that an odour control device was needed to comply with odour requirements. If, indeed, there is no quantitative assessment standard, how did she know this? Furthermore, the evidence given verbally by Ms Holmes yesterday is directly and unequivocally contradicted by Ms Holmes and the Alliance's own documentary evidence.

I will now read from Ms Homes' mediation report of 13 September 1999 on "Northside Storage Tunnel Odour and Health Impacts of Vent Operation at Scotts Creek and Lane Cove West". Please bear with me while I quote from this. The numbers are not important but more the fact that there are numbers. From page 11:

> 4.4 **Air quality goals for the project set by the EPA**
>
> The air quality goals for the project were discussed during a meeting between the Alliance and the NSW EPA on May 21 1999 regarding licence conditions for the Scotts Creek and Lane Cove River West vents. Details of the licence conditions are provided in Appendix A.

That is of the Holmes report:

> The EPA has developed draft ambient odour criteria for operations which emit odour continuously but does not have specific ambient goals for intermittent sources such as the NST [Northside tunnel] vents. Further, as the tunnel does not yet exist and there are no equivalent sources available for measurement in NSW, odour emission rates have not been measured. The approach which regulatory authorities may adopt in these circumstances is to set a design goal for the ambient air and then dispersion modelling can be used to back-calculate the emission rate which will achieve this goal.
>
> It was resolved at the meeting with the EPA that this approach would be adopted and additional dispersion modelling undertaken. The purpose of the modelling was to determine the upper limit of emissions from the Scotts Creek and Lane

> Cove River West vents which would meet design ground level concentrations in the vicinity of the stack with respect to odour and hydrogen sulphide.
>
> After discussion with Nick Agapides of the air branch of the NSW EPA, the EPA determined that a design level of 2 odour units on a 99-percentile basis would be appropriate. This would be based on a 1-hour averaging period using an appropriate peak-to-mean factor to adjust 1-hour model predictions to nose response times.
>
> The design level for hydrogen sulphide was based on a 3-minute averaged model prediction and was set by the EPA at 3 micrograms per cubic metre. Although there is now a move towards modelling with 1-hour averaging periods, historically impacts of individual chemicals have been modelled using 3-minute averages and the goals are based on the results of this modelling.

Now, this is a very important point that I am going do make now. Again, I quote:

> These goals determined by the EPA override any other goals previously used for the project and the dispersion modelling presented below supersedes previous dispersion modelling undertaken for the project. The goals are consistent with condition 51B of the consent dated 31 August 1999 by the Minister for Urban Affairs and Planning to the proposed modifications to the Northside Storage Tunnel presented in the REF. This condition states that "the proponent shall install and maintain appropriate air pollution control equipment at Lane Cove River West and Scott's Creek to ensure that under all operating and meteorological conditions discharges from the vent do not result in an offensive odour or air quality impact at or beyond the boundary of the premises of any sensitive receptors, of other location(s) agreed by the EPA.

I think that should be "or other location(s)". From page 12, section 4.5:

> **Additional modelling for Scott's Creek**
>
> The main uncertainty with modelling for the Northside tunnel vent is the emissions rate.

The Hon. JAN BURNSWOODS: Mr Chair, I know we have a time problem. Mr Kaye is essentially reading chunks of the submission we have had for some time.

CHAIR: No, this is all new material.

The Hon. JAN BURNSWOODS: No, he is currently on page 17 of his submission. I just wonder if it is perhaps necessary for him to be reading out of a submission which, of course, members of the Committee have perused.

CHAIR: I think it is up to Mr Kaye how he wants to use the time available to him.

Mr KAYE: I would like to because I am almost finished, and it will bring to mind the evidence that was given by Ms Holmes yesterday and the evidence that was given by the EPA.

CHAIR: Please continue and be aware that we want to ask questions as well.

Mr KAYE: Fine. Thank you:

> The main uncertainty with modelling for the [Northside Storage Tunnel] NST vent is the emissions rate. In recognition of this the EPA has requested modelling to determine what level of emissions are required to meet the project goals and whether these emissions are achievable with the proposed granulated activated carbon [GAC] filters.
>
> The manner in which the modelling was undertaken was to back-calculate vent concentrations which would meet the EPA design goals in the ambient air at sensitive receptors.
>
> The emission rates assumed that odour levels in the vent stack were 50 odour units and that the hydrogen sulphide level was 50 [parts per billion] ppb.
>
> Figures showing the predicted contours for hydrogen sulphide and odour are presented in Appendix B [of the Holmes report]. Under all assumed scenarios, an odour level of 50 odour units in the stack and a hydrogen sulphide concentration of 50 [parts per billion] ppb would achieve the compliance with the design goals at sensitive receivers under all flow conditions. As will be discussed later, these levels would be readily achievable with granulated activated carbon [GAC] filters.

Finally, from page 14, conclusions, section 4.7:

> Additional dispersion (modelling) undertaken for this report confirms these conclusions and shows that the vents can be designed to meet EPA air quality goals.

Now, I have finished quoting from Holmes' report. The implications of the documentary evidence are quite clear. The EPA set quantitative air quality goals for odour and sulphide. These are the only air quality assessment goals that have been defined for the project. Mr Nick Agapides of the EPA Air Branch supervised the calculation of corresponding quantitative emission limits to comply with these goals. The EPA air quality objectives and the emission limits for the Scott's Creek vent have been comprehensively documented and are matters of public record.

There is further documentary evidence. In April this year, the Alliance presented a technical paper at the Enviro 2000 odour conference in Sydney. The paper discussed the development of air pollution control measures for the Northside Storage Tunnel. The authors of the paper are Mr John Callaghan, who also gave evidence yesterday, and Ms Kerry Holmes. The same Mr Nick Agapides of the EPA's Air Branch was the conference organiser and selected the paper for presentation. Presumably, Mr Agapides would have insisted that any inaccuracy would have been corrected.

The paper nominated the quantitative air quality goals and documented the EPA's role in calculating the quantitative emission limits for the project. The proceedings are a matter of public record and have been widely distributed on CD-ROM.

It is now not credible for the Alliance, Ms Holmes or the EPA to say that the 50 odour unit and 50 parts per billion hydrogen sulphide emission limits were not intended to be compliance standards for the project. In particular, the specification of a quantitative odour concentration limit at the point of discharge is essential for the regulatory control of offensive odours.

Complaints-based regulatory controls are essentially unenforceable in practice and would inevitably result in protracted conflict between Sydney Water Corporation and the community. It is likely that such a conflict could continue for years without a satisfactory resolution. The use of complaint-based regulatory controls will create further, unnecessary stress for the community as complaints are contingent on serious annoyance.

The use of a complaint-based assessment standard for a new project in a sensitive location is unacceptable. Either the EPA has an odour policy or it does not. Documented performance standards cannot be revoked or resiled from because the design and regulatory investigations were inadequate in the first instance and it is now apparent that the project cannot comply. It would be unconscionable for a $450 million Public Works project to be undertaken with no measurable environmental performance standards.

I will now deal with the specific air quality goal for hydrogen sulphide. The technical specification for the Scott's Creek activated carbon filter was issued in December 1999. The specification assumed there would be low concentrations of hydrogen sulphide in the tunnel air. However, the July 1998 to June 1999 monitoring results of the existing North Head sewer system show there can be very much higher concentrations.

Concentrations above the specified maximum value that is in the technical specification for the project, occurred on 87 days. Consequently, compliance with the emission limits for hydrogen sulphide cannot be ensured. That is, there is a significant risk that they will not be met. The emission limits are required to achieve the EPA's documented health-based air quality goal. This is, incidentally, the same air quality goal that is used by Sydney Water Corporation for health impact assessments around sewage treatment plants such as at North Head, and I would also like to add that this is identical with the Canadian national air quality objective and it is also identical with the United States EPA air quality objectives. I would also like to add that DUAP's consultant, Mr Fleer, was not informed of the very high level of concentrations of hydrogen sulphide that had occurred in the North Head sewer system.

I would now like to discuss odour. This is a critical compliance issue. A reasonable standard of engineering practice for a project of this nature would have required odour testing to be carried out at similar facilities or to undertake pilot testing, at least, to get some idea of the capability of the equipment.

At the very least, the Alliance might have referred to relevant odour testing results in the literature or communicated with other sewerage authorities. During the environmental assessment

process, the Alliance submitted a list of 94 activated carbon filters used to treat odours from sewage pumping stations and treatment plants. Yet, not a single odour measurement result supporting the claimed performance for the proposed activated carbon filter was presented then or since.

Had the Alliance tested the odour emissions from Sydney Water's existing facilities or, indeed, undertaken pilot studies, it would have been apparent that the odour from the Scott's Creek vent must substantially exceed the emission limit. Based on my own experience and knowledge, the emission limit would be exceeded by a factor of at least 10 and possibly 20 times.

The modelling evidence that has already been provided by the Alliance shows that the emissions from the vent at this location cannot comply with the air quality goal for odour that has been set by the EPA for this project. I am referring to the more recent modelling that Mr Agapides referred to in his evidence today and even to subsequent modelling that was done by Holmes in December 1999 and in March of this year.

There are no design modifications to the vent stack or to the activated carbon filter that could make the emission comply. Furthermore, the EPA's air quality goal could not be achieved with any known odour treatment technology. I think you only have to look at the design specification for the North Head chemical scrubber for confirmation of that.

I note the evidence given by Mr Alec Dietsch yesterday to the effect that the air flows from the Scott's Creek vent would often be less than the maximum allowable value. However, this would result in reduced exit velocities for the emission. In this case, the reduced air velocities would result in poor dispersion which negates any benefit that might otherwise arise.

The Holmes Air Sciences report of 13 March 2000 shows that the dispersion that would be achieved at the minimum three cubic metre per second flow rate would be very similar to the dispersion achieved at the maximum eight cubic per second flow rate for all the stacking configuration models.

The failure to comply with the EPA's documented odour assessment criteria is sufficient reason on its own to remove the vent from the Scott's Creek valley. If even the most rudimentary odour testing had been undertaken earlier, the location at Scott's Creek would not even have been contemplated in the first instance.

Now, what are the legal implications? The EPA should have been obliged to take these matters into consideration under section 45 of the Protection of the Environment Operations Act. Prima facie, there is already sufficient evidence that a protection of the environment operations licence should not be issued to operate the vent. Furthermore, the equipment installed at Scott's Creek cannot comply with condition 08.1 of the protection of the environment operations licence on the basis of the documented air quality standards that have been defined for the project. Therefore, there may already be sufficient evidence for the EPA to initiate legal proceedings against the Alliance under section 64 of the Act.

There was some other evidence presented yesterday by several witnesses that concerns me, and this is a separate matter which I had not originally intended to raise but now I feel compelled to. If I recall correctly, Dr Corbett, Ms Holmes and Mr Peter Fisher said that they had considered the emissions that could be caused by trade waste discharges. Ms Holmes in her mediation report of 13 September 1999 acknowledges that activated carbon would not be effective in removing volatile organic compounds such as chlorinated hydrocarbons in this situation. In the same report, Ms Holmes nominates trichloroethylene as—

The Hon. JAN BURNSWOODS: Would you mind calling her Dr Holmes? I think she deserves the title.

Mr KAYE: That is fair enough. In the same report Dr Holmes nominates trichloroethylene as a compound that would have the potential to cause an issue in the North Head sewerage system. She notes that this is a chlorinated hydrocarbon used in dry cleaning. She states that "North Head STP detected this in the stack at North Head on one occasion at less than 1 part per billion. Analysis of other samples did not detect trichloroethylene."

Mrs Rosemary Gentle, Director of the Glenaeon School, also gave evidence. She said that the school is now required to accept children with special needs. She said the school has now enrolled a child with multiple chemical sensitivity. In the 13 September 1999 report, Dr Holmes cites some of my work as authoritative. The work she cites relates to the chemical composition of the atmosphere conditions from sewage.

Based on my knowledge and experience, very much higher concentrations of chlorinated organic compounds from trade waste discharges occur in ventilation air in sewers. Given the location of the event and the consequences of Ms Gentle's evidence, the occurrence of chlorinated hydrocarbons is a serious matter that should be thoroughly investigated. That concludes my remarks.

The Hon. J. H. JOBLING: Looking at your curriculum vitae, I note you appeared as an odour specialist providing technical support to Sydney Water's odour reduction program for sewage treatment plants. To your knowledge, have other Sydney Water sewage filters been regularly serviced and tested for pathogens, and I refer to those that are carbon filters, and could you explain to me in your view as to whether these types of filters are effective for the removal of aerosols especially under medium to high humidity conditions?

Mr KAYE: There is no microbiological monitoring that I am aware of. There is no odour monitoring that I am aware of. And I have never seen hydrogen sulphide monitoring results of these installations. Based on my direct observation of these facilities, they become very wet in operation and aerosols are created. However, I am no longer an employee of Sydney Water.

The Hon. J. H. JOBLING: Can you deal with the other part as to whether they have serviced the carbon filters regularly and also are they the right type of filter? Is this impregnated carbon filter the right type of filter to be using?

Mr KAYE: Based on my direct knowledge I cannot answer that. Those installations were a division of Sydney Water, which because of its organisational structure did not communicate with me.

The Hon. JAN BURNSWOODS: Mr Kaye, I also was looking at your resume and I note that you have a degree of Bachelor of Science in Chemical Engineering from Newark College of Engineering in New Jersey?

Mr KAYE: Yes.

The Hon. JAN BURNSWOODS: Can you tell us what other qualifications you have?

Mr KAYE: Only about 26 years of experience in the environmental engineering area.

The Hon. JAN BURNSWOODS: But I am particularly interested in—

Mr KAYE: Do you mean formal qualifications?

The Hon. JAN BURNSWOODS: Well, I am particularly interested in the fact that you seem to be setting yourself up to know more about odour in particular than New South Wales Health, so I am interested in your grounds for that stance.

Mr KAYE: Okay. I actually introduced the type, or was instrumental in the introduction of, the type of odour testing that is now used in Australia when I was Deputy Manager of the Centre for Wastewater Treatment at the University of New South Wales. In that capacity I subsequently managed the odour research laboratory and undertook countless odour surveys for sewage treatment plants and have done the same sort of work in Sydney Water, and I have probably reviewed the results of probably at least 2,000 odour samples from sewage treatment plants.

The Hon. JAN BURNSWOODS: I note your details from the University of New South Wales again in your resume. You have been very critical of Dr Holmes and her evidence. Do you think your background qualifies you to know more than Dr Holmes?

Mr KAYE: Most certainly. I do not criticise Dr Holmes' ability as a modeller. I only criticise her selection of input information to be used in her modelling, and I would say that I am certainly more qualified to judge the appropriateness of that input information based on my experience.

The Hon. JAN BURNSWOODS: I suppose we have the difficulty that we have heard from people and obviously we have read reports from a whole number of odour consultants, and the ones that have been mentioned are Frank Fleer—you were here and I think heard about the Fleer report this morning?

Mr KAYE: Yes.

The Hon. JAN BURNSWOODS: —Terry Schultz, Sydney Water's expert; the EPA; the Department of Health. There is quite a body of experts that are saying things different from what you are saying. I am interested in why you feel that you are able to stand up against that range of opinion.

Mr KAYE: Based on my knowledge and experience, and that is evidenced by the many papers that I have published in this area, some of which have been cited by not only Dr Holmes but also by Frank Fleer. I would let my record stand on its own.

CHAIR: Do you have any information on pumping stations around Sydney where carbon filters are used? Evidently the humidity is so high that the pipes on the outlets are full of water and they drown the monitoring devices. Do you have any information on that?

Mr KAYE: Just only my direct observation, only what I have actually seen on site.

CHAIR: And what have you seen?

Mr KAYE: That the monitoring lines become or the system becomes so wet and so much water is emitted from the system as aerosols that in fact it could fill the monitoring lines that are used to detect hydrogen sulphide in the emission and that that amount of water is sufficient to render that equipment inoperative.

The Hon. JAN BURNSWOODS: Mr Kaye, you have stated in your submission that carbon filters are actually used to culture Legionella.

Mr KAYE: No, I did not say that.

The Hon. JAN BURNSWOODS: What did you say?

Mr KAYE: I said that activated carbon in itself would be a reasonable substrate for growing, well, Legionella, and as evidence for that, activated carbon is used in the culture media for the Australian standard test for Legionella.

The Hon. JAN BURNSWOODS: But following on from that, is it true that to grow bacteria in carbon filters food sources are necessary? And do you believe that there would be a food source present on the filters that we are talking about?

Mr KAYE: Most certainly.

The Hon. JAN BURNSWOODS: What kind of proof or evidence can you suggest for that?

Mr KAYE: Well, okay, I did refer to personal communications with the suppliers of activated carbon. But, okay, I will answer that question in two parts. First off, the activated carbon by its nature will certainly adsorb some of the organic material from the sewage on to its surface, and this is not to—and also there will be a deposition of organic matter from some of the aerosol matter from the tunnel that deposits on the surface. But the air is in itself sufficient to provide nutrients, or what is carried in the air is of itself sufficient to provide nutrients for microbiological growth. Now, I can give you some evidence from my own personal observation in the laboratory.

The Hon. JAN BURNSWOODS: You do not have any written evidence or you cannot refer us to documentary evidence?

Mr KAYE: To documentary evidence? No, I do not have any. I could only refer you to my personal observations in the laboratory.

The Hon. JAN BURNSWOODS: Could you tell us a bit more about this personal communication you referred to? Is that a letter?

Mr KAYE: No.

The Hon. JAN BURNSWOODS: A phone call?

Mr KAYE: No, it is a telephone call.

The Hon. JAN BURNSWOODS: Can you tell us who from?

Mr KAYE: I have. I have named two technical salespeople, technical managers from activated carbon suppliers in Australia, their names and their companies.

The Hon. JAN BURNSWOODS: Sorry, I must have missed that. Where are the names?

CHAIR: We are going to have to wrap up.

The Hon. JAN BURNSWOODS: I have a lot more questions.

CHAIR: We are running out of time.

The Hon. JAN BURNSWOODS: That is one of the reasons why before I reminded you and Mr Kaye of how much time he was taking. I guess I could always put questions on notice. He has used such a lot of time reading things out.

CHAIR: Mr Kaye, could you be very precise?

Mr KAYE: Mr Peter Cullum, the Sales Engineer for Pica Carbon, and Mr Jerry Perara, the Technical Manager of Hycarb.

The Hon. JAN BURNSWOODS: So these are people who are salespeople for a system?

Mr KAYE: One is a sales engineer; the other is a technical manager.

The Hon. JAN BURNSWOODS: Now, I suppose I have a whole lot of questions about your submission which, as you probably gathered, I was looking through. I will try to speed them up, although some of them could go on notice. You make quite a point in your submission saying that critical information has been withheld from the assessment process, and you give an example. For instance, you quoted the hydrogen sulphide concentration in excess of five parts per million on 87 days and a peak of 21 parts per million, et cetera?

Mr KAYE: Yes.

The Hon. JAN BURNSWOODS: They are, as you would realise, taken from an EPA report and, therefore, are hydrogen sulphide concentrations in dry weather flows. Are you aware that in the same EPA report figures are quoted for wet weather flows and they give the typical level as between one and two parts per million with a maximum of 3.8 parts in the 1998-99 period that you refer to? Of course, the point of this is that the tunnel operates only during wet weather?

Mr KAYE: Yes.

The Hon. JAN BURNSWOODS: And the tunnel obviously only vents for some 150 hours in total over the year. So I am concerned that you have used a report, you have quoted the wrong figures

from the report, and you then seem to have built a fairly considerable castle based on these wrong figures.

Mr KAYE: Okay. I would like to answer that.

The Hon. JAN BURNSWOODS: I would like you to, too?

Mr KAYE: I did not take that information from an EPA report. I took that from the Sydney Water licensing report, which is in their library. That report—

The Hon. JAN BURNSWOODS: Does that make any difference?

Mr KAYE: Yes, it does. That report does not nominate which days are wet weather and which days are dry weather. There are just the daily—

The Hon. JAN BURNSWOODS: Look, I am sorry, but on page 9 of your submission in inverted commas you say, "The annual EPA licence report 1 July 1998 to 30 June 1999 plainly shows" blah, blah, blah?

Mr KAYE: Well, it does plainly show that.

The Hon. JAN BURNSWOODS: Whichever library you got it from, nevertheless, you are quoting the report selectively?

Mr KAYE: It is raw data. No, I did not quote selectively. That report contains raw data. That report does not say, "These days are days of wet weather flow; these days are days of dry weather flow". The report simply does not say that.

The Hon. JAN BURNSWOODS: I am sorry to disagree with you but my understanding is that the report does distinguish between dry weather flows and wet weather flows.

Mr KAYE: Well, your information is incorrect.

The Hon. J. F. RYAN: Is it possible that you are using a secondary source which might only partly quote data and if you went back to the primary source it might give you more detail?

Mr KAYE: I am referring to the report, the only report that I have access to, which is the report that is in the Sydney Water library. But, nevertheless, wet weather or dry weather is still relevant because the licence conditions for this project say that standards must be met under all operating and flow conditions, all operational and meteorological conditions, and the filling with raw sewage under some circumstances falls within the parameters of the licence. Any prudent designer would have taken that information into account.

CHAIR: We have to wrap up.

The Hon. JAN BURNSWOODS: Well, I do have—

CHAIR: One last question. You can put the rest on notice.

The Hon. JAN BURNSWOODS: See, the trouble is I have a number of other questions, which I guess are similar in the sense that they refer to what you have said in your submission and then I believe present evidence that you have not included. Perhaps I will give some of those to you on notice, but perhaps I could just finish by referring back to the question that Mr Jobling asked about your working for Sydney Water. I believe you said you are no longer an employee of Sydney Water?

Mr KAYE: That is correct.

The Hon. JAN BURNSWOODS: Is it the case that while you were working for Sydney Water you made a submission to Sydney Water Alliance attempting to raise questions over the odour

assessment and that you were actually at the time putting material on behalf of the school while nevertheless being an employee of Sydney Water?

Mr KAYE: That is definitely not the case. I can tell you that I was engaged by the school in May this year. The last day that I was employed by Sydney Water was 26 November 1999.

The Hon. JAN BURNSWOODS: So when was the REF process?

Mr KAYE: The REF process. I submitted that information to the Alliance on behalf of Sydney Water. I was the Sydney Water odours and emissions specialist. The only access that I had to any information at all concerning the tunnel was in the REF, and the only reason that I had the opportunity to comment was because I was asked to by Sydney Water's environment branch.

The Hon. JAN BURNSWOODS: So a branch of Sydney Water asked you to make a submission to that review?

Mr KAYE: That is exactly right, and I did.

The Hon. JAN BURNSWOODS: When did you have your contact with the school?

Mr KAYE: The submissions that I made to the Alliance would have been round about June of 1999, and they were not submissions to an inquiry; they were internal documents that were Sydney Water concerns that were raised to the Alliance in the context of the REF.

CHAIR: We must wrap up at this time, I am afraid.

The Hon. JAN BURNSWOODS: Could I just point out that you have not answered my question?

Mr KAYE: I do not understand what your question is.

The Hon. JAN BURNSWOODS: You have not answered the last question.

Mr KAYE: I thought I had answered it.

The Hon. JAN BURNSWOODS: You have not answered the last question, which was when did the school first contact you?

Mr KAYE: The school first contacted me in May this year, in May 2000. I have only been engaged by the school for a period of a couple of months.

The Hon. JAN BURNSWOODS: I did not ask how long you had been engaged by the school.

Mr KAYE: They first contacted me in May this year.

CHAIR: Thank you very much for that. I am sorry that time is so short. Thank you for your evidence.

Mr KAYE: You are welcome. Thank you for giving me the opportunity to speak.

(The witness withdrew)

MARK JOSEPH DONOHOE, Medical Practitioner and Consultant advising the Glenaeon School and Willoughby Council on the risks related to the Scott's Creek vent, 129A Raglan Street, Mosman, affirmed and examined:

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Dr DONOHOE: Yes.

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

Dr DONOHOE: 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 usually accede to your request and resolve into private session. But I should warn you that Parliament may override that decision at any time and make your evidence public. Do you wish to make an opening statement?

Dr DONOHOE: I do. I am a medical practitioner with 20 years experience, 15 years in the field known as environmental medicine. As a doctor, my principal concern is the protection of those who seek my care. I see many cases of environmental exposure affecting children, the sick, elderly and pregnant. I see the suffering and the problems of those people who are often called the statistical outliers or the unusual people, but the ones who suffer the effects of environmental exposures at unusually high rates.

It is clear in these people what the risks are and the causes of their illness are often apparent. My main concern, however, is for the health of children. They rely on our best care and not the concepts of acceptable risks being made by adults and regulatory authorities deciding what is acceptable for a generation who are taking the brunt of our decision-making consequences. The net effect of dozens of acceptable risks in our society in the last three decades has led to unacceptable outcomes in child health, namely 300 per cent asthma increases, increases in behavioural disorders, learning disabilities. Our children, in a sense, have never been sicker, with higher infection rates. They live longer but they do not live well.

My concern as a doctor is that we should also follow the path that the Americans have of assessing the children as susceptible individuals and we should not simply apply occupational and irrelevant standards to children because the consequences of our failure to act in their interests and our failure to protect them are too high.

Children are not small adults. In the United States over the last four years there has been an allowance of this, namely the increase in the safety factor of chemical exposure by a factor of at least 10 and on occasions up to 100. This is yet to be followed in Australia where children are simply considered small adults with no specific allowances being made for their increased risks.

There are different consequences of mistakes. Children live longer, they are growing quickly, the brain, nerve and immune systems are developing, and what is acceptable for 24-year-old healthy males who are often the people who are studied in scientific studies, can be utterly unacceptable to the health and development of a young baby or a child.

Further, the concept of acceptable risk is a nebulous concept. The question has to be asked, acceptable to whom. It must be understood that risks and benefits may not be equally spread. The risks may be born by one community, in this case a school or a community around the Scott's Creek vent, in order to increase benefit for Sydney or the community as a whole, but the best and most valid way of reducing the risk benefit ratio to acceptable levels is to reduce risks to the lowest achievable standards.

I would further say that the scientific literature supports the view that people who send their children to Steiner schools have made a choice based, in part, upon health outcomes, and the health outcomes of children attending Steiner schools seems to be superior in terms of allergy infection and

doctor-visit rates compared to the rest of the community. This is not your ordinary school. This is a school where lifestyle choices and choices of health and education are made, in part, to improve health.

So, even if you were to say this were to be acceptable in the general community, we have a particular school whose parents have made a choice to minimise health risks and to look after the health of their children. I believe that this would make it an unacceptable risk to place the vent near the school. On that basis, my suggestion would be that the site of the vent should clearly be far from any school or any place where children are and far from any community.

Based on the literature I have reviewed, three to 500 metre exclusion zones could be considered a minimum standard for such vents and preferably based, again, on the same literature, a distance of greater than one kilometre would appear to be acceptable. I am also concerned that there is an issue of the cost of the vent, that when we come to cost benefit, there seems to be a view that if we reduce costs in the short term, that this is an acceptable way of achieving benefit for the community.

My concern with the situating of the vent where it is may save dollars in the short term, but that is a false assessment of the true cost. The immediate costs have to be increased by an amount which allows for health surveys. Assuming that this was situated near a school, there would be a necessity for an active monitoring of the health of the community and the control community to ensure that safety was achieved. There would be increased costs of monitoring because monitoring would be required near the schools at a higher level than it would be if the vent were situated far from the community.

There needs to be an increased margin of safety which means, for example, increasing the rate that filters are changed in the vent and increasing the margin of safety inevitably results in an increase in the running costs of any equipment or machinery. There needs also to be an allowance for future health, environmental and property loss suffered by the community which we ask to bear the risk of such devices.

It is my view, based on what I have seen to date, these future costs and more nebulous costs have not been taken into account nor have the costs of any adverse effects on the general community through Medicare.

I would also address one last issue and, that is, what do we do where knowledge is not complete. In my view, having reviewed the literature, having listened to the arguments on both sides, we have what effectively is an experimental set up in the Scott's Creek vent. We do not have good models upon which to base it.

I note that in a 1979 report written by Johnson and Camann, the conclusion of that report was:

> The primary difficulty in designing a definitive health watch regarding sewage is the lack of a sufficiently large sensitive population, that is, young children whose immunological defences against infectious disease are still developing, but resides close enough to the source to receive a high dose of aerosolised agents.

Clearly, my concern is that we do not wish to become the community in the country which creates the experiment that nobody wished to see done in the first place and that allowing a vent to be close to a school is an abrogation of the precautionary principle. We do not know enough about the health consequences. We appear, in the absence of adequate knowledge, to be prepared to take risks with the health of the children who live in the area and the health of the community in general, and we have not made provision for how we would compensate that community or how we would address the community concerns should they arise at a later date.

It is my view that we should err on the side of caution. Where data are lacking, the erring on the side of caution would be to situate the vent at a distance of at least 500 metres and preferably more than one kilometre from any susceptible population, including the community and the school.

CHAIR: What specific experience do you have which enables you to assess the health impacts of the tunnel exhaust at Scott's Creek?

Dr DONOHOE: There are a number of areas of experience. First, I have been involved in health assessments as a medical practitioner for 20 years now. I have seen people from the area and

from similar areas affected with exposure to aerosolised bacterial agents. I have been involved in ongoing research into health effects of chemicals on human health and have published it in medical peer review literature over the last decade and, on this occasion, my expertise that was sought was the ability to review the scientific literature, to summarise it and to come to conclusions on the quality of evidence.

Now that is also one of my jobs, that I do the same type of reviewing of evidence for medical journals, one in Britain called "Focus on alternative and complementary medicine". It is the same type of work. It is simply a matter of reviewing available evidence, coming to conclusions about the quality and the strength of the evidence, defining data gaps and then making those data gaps and areas for future research more accessible to those who read the reports.

CHAIR: You compiled a detailed report for the Scott's Creek community on the subject. On what information did you base your report and what was your opinion after doing this research?

Dr DONOHOE: My expertise, my opinion, was sought, and I cannot tell you who it was who originally sought that opinion. I was commissioned to look at the available literature. I was provided papers and documents, most of which are nominated in this report. The rationale for the report was for me to look at it. There was no pressure upon me to find for or against the safety of a vent, and after reviewing the literature, which amounted in total to round about 700 to 800 pages of reports and literature and original articles, I wrote the report based on the information in that reviewed literature.

I also researched, again, from the Internet, from Medline and from the libraries and so sought specific information where data gaps existed, and the report stands as one which was commissioned and completed in a very short period of time. Although extensive, there are areas that I would have far preferred to have had the resources and time to go further into, and on the basis of the limitations I placed at the beginning of that report, I am quite comfortable that the report represents the literature available on the safety and health of such vents.

CHAIR: Would you agree that the condensation in an activated carbon filter would make a suitable medium for the growth of Legionella bacteria and other pathogens and would enhance the route of pathogens being transmitted in aerosols when the proposed Scott's Creek exhaust operates?

Dr DONOHOE: In principle. I have said already that I believe the unit is experimental in nature and it is not being done in the same way in a lot of the design of carbon filters, and a lot of the planning has been done on the run and in response to demands and questions of the community group. I am not convinced that there is a set and well-recognised standard and basis upon which the carbon filtration system as it is designed is going to be protected but, in principle, any area which accumulates moisture—and that is the pathogens deposited on the surface—provides a medium and a culture for those organisms to increase over time and provides an area from which aerosol formation can occur.

Now, I do not pretend at all to be an engineer. I would not presume to go into the details of how carbon filters are designed. All I am saying is that on surfaces where there is moisture and pathogens the typical medical view of that is that that is the ideal culture for generation of more pathogens and eventually the aerosol formation or the droplet formation which can happen in those situations can lead to exposure of individuals and subsequent disease.

The Hon. JAN BURNSWOODS: I interrupted before because in answer to Mr Jones I think you said you had seen people from the area exposed, and then I sort of missed the rest of it.

Dr DONOHOE: I am sorry. I have seen people who have been exposed to wastewater who have suffered adverse health effects. I have separately seen people from the area of Scott's Creek. My medical practice covers the whole of the Sydney area. It is a referral-based practice. I have not seen people from the Scott's Creek area sickened because of anything. I am saying that I have seen people in the area already, unrelated to any vent, any sewage, any drainage, with other health problems. I have separately seen people who after exposure to sewage in, say, ocean outfalls, have become sick with a range of different illnesses, infectious diseases and other disorders.

The Hon. JAN BURNSWOODS: So you have seen people from the area just as an ordinary GP?

Dr DONOHOE: Yes, as a doctor. My medical practice is not a typical GP's. Generally, people are referred to me by other medical practitioners. It is unusual for me to see people who self-refer.

The Hon. JAN BURNSWOODS: And referred for what?

Dr DONOHOE: Referred for assessment of health problems, for assessment of chronic fatigue syndrome, for assessment of allergic disorders, recurrent infectious diseases. They are the typical reasons that doctors ask me to see people.

The Hon. JAN BURNSWOODS: And you test people or you send things to a laboratory?

Dr DONOHOE: Generally, first up, I examine them and I get their occupational, medical and environmental history. If that is all that is required to identify the risk and the outcomes, then nothing further is required. If immunological and microbiological testing is required, then I request that, and then when a cause or reason for the illness is found I refer the person back to their referring GP.

The Hon. JAN BURNSWOODS: So are you aware from all of your experience and from your literature search of any illnesses associated with the venting of gas from Sydney's existing sewerage system and, in particular, existing vents?

Dr DONOHOE: No, I do not think it would be possible to become aware of that. We have had no surveillance for adverse effects. As I said in my introduction, we have had increases in asthma infection rates. We have childhood illnesses increasing. We have many different things that happen in society at the same time and separating one item from the other, especially with the number of vents that Sydney Water has all over the Sydney area, is almost impossible. To identify a difference, one needs a control group. If one has no control group, then what we see is population changes in health rather than differences from one community to the next. On this occasion, the opportunity would be there to assess the health of a matched community prior to the introduction of a vent and to see how the community's health, the two communities, go off into the future identifying the major difference in the situation of that vent, and that may be a rational way of going about the health assessment, as I was saying.

The Hon. JAN BURNSWOODS: Given what you said about the lack of evidence now, if Scott's Creek already has a vent, which is a vent with a pretty high concentration of raw sewage, and the proposed vent has a considerably diluted and occasional quantity of sewage, how can you then go on to assert that the air vented from the new vent in relation to the studies you might be able to do is going to pose an unacceptable health risk?

Dr DONOHOE: As I have said, it is not that I know that it will. I am saying that we do not know that it will not. This is not the same thing. We do not know what the health risk is from the sewage that is currently overflowing those pipes there at the moment, or the structure there at the moment. Since it is unstudied we have no base line against which to assess it.

The Hon. JAN BURNSWOODS: If that is the case how can you assert that the proposed vent poses an unacceptable health risk?

Dr DONOHOE: I think you misunderstand what I have asserted. I am saying that there is no knowledge about the risk associated with the vent. The vent, as it stands, may or may not be an improvement on the current situation. The assumption that it will necessarily be an improvement was addressed in mediation, and a number of us, myself included, said there was absolutely no evidence that there would be a net improvement.

You could argue that the new vent has a higher risk of a catastrophic failure than the current system. If there was a catastrophic failure, does that increase the risk? Maybe it does. But there is a difference between the two ways of being exposed to pathogens. The assumptions about the aerosols and the amount taken from the current sewage are untested. Since they are untested and since nobody has looked at it, one cannot assume that it is safer or less safe. I know it is tempting to say, "Gee, it must be bad at the moment. Therefore anything we do technologically must be an improvement."

I am saying that the opposite can be true. A vent can act as a means of accumulating pathogens and making them airborne because of failure of maintenance or catastrophic failure, which could never ever happen with the overflow that currently occurs. Therefore, the risk could well increase, rather than decrease with the technological fix. The assumption that technology fixes problems that already exist is not tested yet. Therefore, one cannot assume that. I have not said I know the vent will cause problems. I am saying that the lack of knowledge, the lack of safety data, the lack of ability to come to a conclusion on it makes that an untested hypothesis.

The Hon. JAN BURNSWOODS: And I gather, therefore, that either in your Medline search or your literature search, your paper search, you have not found any evidence from elsewhere in the world or this country to enable you to say more than "could", "can", "might"?

Dr DONOHOE: There are plenty of studies which I have nominated in my paper. They are fully outlined there. They show increased risk of gastroenteritis, respiratory infection, time off school. So the basis upon which I make the suggestion that it is worth following through is that the only studies done which have attempted to assess community outcomes find that there is an increase in those illness rates but not catastrophic epidemics.

I do not consider it likely that there will be catastrophic epidemics from a vent. I consider the larger problem to be one of the same type of lower level rates of illnesses, increased asthma rates. I consider those to be far more likely problems. But do not mistake that I am saying that I know this vent and I know that it will cause problems. I am saying nobody knows the outcomes of this vent as yet because it is untested, and it is not sensible to make your first test subjects children in a school 50 to 100 metres nearby. That is my point. It is not that I know it will be bad, but I am not convinced that it is safe.

The Hon. JAN BURNSWOODS: In the literature search that you did that you present in your report, why have you not mentioned one report in particular which I understand is a pre-eminent one, and that is the British study entitled "Health Hazards at Wastewater Treatment Works", which was produced in 1994?

Dr DONOHOE: Part of the reason for that was that it was produced by Sydney Water as a kind of search off the Internet. It was not a formal publication that was available. It was done on an Internet search, and as it turned out at the mediation —

The Hon. JAN BURNSWOODS: But is not your Medline search an Internet search?

Dr DONOHOE: Yes, it is. Medline is the scientific medical literature related to illness and disease. It is not part of journals that were published in Medline. A Medline search would never turn up an article of that type. That is a commercially commissioned article. Medline is the review of the scientific—

The Hon. JAN BURNSWOODS: There seem to be an awful lot of commercially commissioned articles. Are not you paid to do the work you do?

Dr DONOHOE: Well, I am paid minimally, I have got to say. I was paid a trivial amount.

The Hon. JAN BURNSWOODS: Are you going to tell us how much?

Dr DONOHOE: No, what I am saying is that in Medline—

The Hon. JAN BURNSWOODS: You are paid to be here telling us what you are telling us?

Dr DONOHOE: No, I am not. I am here off my own bat losing—

The Hon. JAN BURNSWOODS: You are here on behalf of the community?

Dr DONOHOE: No, I am here today of my own expense, losing patient times which I have had to cancel to be here. There is nobody paying expenses for me. I am here of my own accord.

The Hon. JAN BURNSWOODS: But you are being paid to do the literature search, the Medline search?

Dr DONOHOE: One year ago I was paid a small amount of money to spend time away from my practice to do the literature search. To that extent it is true. But my income as a result of that was less than one-third to one-quarter of my normal income. It was an acceptance on my part that a community could not afford what normally would be paid to me by WorkCover and other authorities that seek the same information. And it was an intention on my part to simply proceed along with the report although there was no finance to pay for it in any commercial sense.

My point about the article you refer to, though, is that it was a commercially produced article. It was authoritative in the sense that the people who did it are well respected, but the medical literature is somewhat different. In the medical literature there is the necessity for scientific peer review before publication and there is an overt statement of all commercial interests involved so that one can look at the kind of medical literature and say, "Is it or is it not credible?" whereas commercially created documents have a slightly darker side to them, and that is that they are paid for and funded somewhere. If there is no requirement of divulging details of where that arose, which is the case in this, there is no way of assessing the validity of the information provided. It is not that anybody is nasty and trying to fool the populace; it is simply a question of which questions do you ask.

The paper that was shown to me did not ask relevant questions about the safety of children in the community near wastewater treatment. It came to the conclusion that risks were not large for communities in general relating to the wastewater, and I can perfectly accept that. It is not a question of is this safe for Sydney. My concern is for a school nearby and for residents nearby and for the sick and weak. I have no doubt that Sydney Water would have done its work and the Alliance would have done its work and have come to the conclusion that this is good for the community overall. I have no doubt either that sewerage is good for society as a whole. I am not against this. I am simply against the placement where the data are weak in a place where the risk is high. The sensible idea is that when the data is weak you take a precautionary approach, not an aggressive approach, to placement.

The Hon. JAN BURNSWOODS: So you are not aware of any illness associated with the current overflows?

Dr DONOHOE: No, but the reason I would not be aware of any illness associated with it is that I do not think there has been active surveillance to try to identify illness associated with that. So far as I am aware, there is no matched community where we know the health of two different communities proceeding on what is called a control community against the community at Scott's Creek, so there is a view, and in fact I have every sympathy with it, that the current situation is a stuff-up, that there is sewage overflow into the waters nearby that makes swimming in the area dangerous and untenable, and I do not have any doubt that it would be dangerous in those times to go swimming, but overflow is not the same as a vented aerosol. An overflow can be an entirely different process.

The Hon. J. F. RYAN: There is something special about the particular overflow at Scott's Creek in that it does vent in an aerosol fashion, though?

Dr DONOHOE: Yes.

The Hon. J. F. RYAN: The argument that Sydney Water put is that for some time water has been ventilated in that fashion or aerosoled in that fashion for some time very close to the school?

Dr DONOHOE: Do we know that?

The Hon. J. F. RYAN: Well, it happens. They have got it on video. It seems to occur and it is not far from the school. The position that Sydney Water would put is that the removal of that and its replacement by the tunnel, by logical definition, is likely to result in health improvements.

Dr DONOHOE: I do not have any problem with that. It is a question of where do you situate the vent. It is better to fix broken things. That is broken and it is placing a risk and I do not have any doubt that there will be a risk for the community, but if you are saying is it better to be hit on the head

four times or only twice, clearly it is better to be hit on the head only twice. It is better to be hit on the head not at all.

The Hon. JAN BURNSWOODS: What would you do with the 20,000 vents in Sydney?

Dr DONOHOE: What would I do with them?

The Hon. JAN BURNSWOODS: Given what you are saying, that anything can happen and it is better to be sure. We heard evidence yesterday that those 20,000 vents have developed since 1894. What are you suggesting we do with them?

Dr DONOHOE: I am not suggesting that we do anything with them.

The Hon. JAN BURNSWOODS: They do not worry you?

Dr DONOHOE: No, it is not that they do not worry me. It is that they have become a part of the scenery.

The Hon. JAN BURNSWOODS: I am not talking aesthetically here.

Dr DONOHOE: No, I understand what you are saying. I do not think we can use the argument we have stuffed up so badly in the past that any stuff up in the future is acceptable.

The Hon. JAN BURNSWOODS: No, I am not arguing about that. I am trying to find out how you, who say there is no evidence that you can produce of current health risks, can then talk about your assessments.

Dr DONOHOE: You are certainly misquoting me. There is not evidence of current health risks in the area because the vent is not in the area. It is not functioning. It is not making people sick.

The Hon. JAN BURNSWOODS: There is a vent in the area. There is an aerosol effect from the overflow. We have all seen the effect of the water, the droplets, et cetera. We know at the moment there are gases. We know there is an aerosol effect. You have talked a lot in your submission about venting of gases and aerosols, but we seem unable to pin down the evidence you have in relation to the current situation or anything you have found from Medline or a paper search about the likely future situation.

Dr DONOHOE: I just said to you what I found in the paper search and that is that illness rates do go out in the areas where the explosion of pathogens in the area is high.

CHAIR: These are quite different vents, of course.

Dr DONOHOE: There are a number of factors that are getting mixed up here. One question was what about overflow. Yes, it is good to get rid that have overflow. What is the replacement for it? A good replacement would be something better, situated away from an area where there is potential hazard to anybody. So, to say it would be better for the community than the stuff-up that exists at the moment, I would accept that could be true but there is a better alternative further and, that is, the vent it replaces is not situated in that same area. When it comes to the question of where do you locate something, it is better to fix it properly than to partially fix it and to continue the risk at any level in that area.

The Hon. JAN BURNSWOODS: Where would you put it?

Dr DONOHOE: I do not think that is a question for me to answer. I have said to you that I think the literature says greater than one kilometre from susceptible communities.

The Hon. JAN BURNSWOODS: At the moment we have 20 thousand vents situated—

Dr DONOHOE: But you must appreciate that the majority of those vents suck in air most of the time. That one vent will probably suck in air most of the time and at least 10 per cent of the time

there will be a reversal of that, so exposure will occur, as they estimate, round about 10 per cent of the time. I can even accept that. The vent is something which is different. It is the focusing of a lot of those small vents into a small area. The 20,000 vents have one thing going for them.

The Hon. JAN BURNSWOODS: For 150 hours a year.

Dr DONOHOE: Yes, for 150 hours a year. And I would guess that if that estimate is right, and my guess about the way weather is going at moment that is a flexible figure that changes as time goes by.

The Hon. JAN BURNSWOODS: The whole basis of my question is about evidence.

Dr DONOHOE: There appears to be an increase in rainfall. I would put it to you that everything in here is a guess and that nobody has any hard information on safety or health effects. Therefore, we need a principle. If we are honest, Sydney Water, the Alliance, everybody is having to make guesses because of the absence of evidence. Now, there is an absence of evidence no matter how you look at that. Therefore, we are left with how do you make decisions when you have to guess.

The Hon. JAN BURNSWOODS: Can you tell me what evidence you have for your comments on page 14 linking asthma rates to sewage emissions?

The Hon. J. F. RYAN: It might do well to say, do you have a link between asthma and sewage?

Dr DONOHOE: There is a link between asthma and respiratory infection.

The Hon. JAN BURNSWOODS: On page 14 we hear about asthma. I am wondering whether you are saying asthma is related to sewage emissions. Do I understand you are now saying it is not, or did you just mentioned it because of the nature of the school.

Dr DONOHOE: This is a paragraph related to Glenaeon School. Glenaeon School is a Steiner School. The first study done on that published in the *Lancet* showed they had half the rate of asthma. I am pointing out that it is a community which is unusually good.

The Hon. JAN BURNSWOODS: In the next paragraph you are talking about additionally an increase in asthma rates.

Dr DONOHOE: Or illness rates which may be considered not significant or acceptable to the general population may be significant to a group of such children.

The Hon. JAN BURNSWOODS: Are you trying to imply that somehow this vent will increase asthma?

Dr DONOHOE: I am giving the options about what it can do. There is good, medical evidence that recurrent respiratory infection is a predisposing factor to increase asthma rates. If there is increased respiratory infection in the area, and that has been shown in two of the studies I quoted in my paper, then you have by inference an increase in the risk of asthma mainly because the infection rates are associated with increasing asthma rates. There is a separate issue of infection rates.

The Hon. J. F. RYAN: Can I read you a section of the DUAP report which is relevant to this:

> If it is assumed that ineffective particles can reach the school grounds, then one must question the method by which the children will become infected. Some enteroviruses will be breathed in or will infect through former transmission.

Which I do not profess to know:

> Others, such as Hepatitis A virus or Salmonella bacteria will need to be ingested on food through drinking water, as they are rarely transmitted by aerosols. In fact, the Salmonella to cause an active gut infection up to 100,000 organisms may need to be taken at the same time.

I understand from that paragraph that essentially the only dangerous bugs that came from sewage, essentially only give you are an infection if you eat something or for some reason or other swim in the water, for example, and drink some of the fluid. The concept of becoming ill from sewage by it being transmitted passively through the environment is not, that seems to be saying, likely. There has been a discussion about Legionella, but in all other areas it is not likely that you will become infected by airborne bacteria from sewage. Do you understand?

Dr DONOHOE: I understand the argument. Firstly, it is incorrect. It is great that there is an assertion there, but it has no grounds. The viruses that they are talking about and the pathogens do show up as increased illness and disease rates in the population. If this paragraph were correct, it would not be so. It is fine to have theories about how disease should not occur. It is difficult when you use those theories to try to explain away disease rates that do occur in the community.

The point of quoting papers that show increased disease rates in the nearby population, increased absenteeism rates, increased respiratory infection, increased gastrointestinal disease and dermatitis, is to say whatever your theory about the means of transmission, most of microbiology is guesswork. The bugs get there, and they have said, ridiculously, up to 100,000 organisms is needed. What rubbish is that. As few as a dozen will be needed in sick people to cause exactly the same disease. To say up to 100,000 organisms is a more meaningless way of implying that there is very low risk when really they can be quite significant risks.

The outcomes of exposure to communities shows that these illness rates do increase. How does it increase? Our theory may not be very good at explaining it, but our theory was not good for Legionella until 25 years ago. It could not exist either. Then suddenly we found it did. The mechanism is not always decided until you come to understand and study the people who have become infected. So, in my view, the medical literature that looks at the outcomes and says does it occur, has a greater relevance in this particular situation because the mechanisms of a lot of microbiology and a lot of risks are unknown. The fact that it occurs is in the literature. The view that it should not occur is utterly irrelevant. The view should then be how does it occur.

The Hon. JAN BURNSWOODS: May I follow up on Mr Ryan's question. You commented that most microbiology is guesswork. How do you assess the risk of Legionella, then?

Dr DONOHOE: Legionella, until the outbreak of—

The Hon. JAN BURNSWOODS: No, I mean at Scott's Creek.

Dr DONOHOE: I am not an expert on Legionella. The Legionella organism, in my opinion, is grossly overrated as a massive focus on one organism because of our awareness of the severity of the illness it can cause to the exclusion of many other illnesses, which can be not as serious but more prevalent. No, I believe you heard Ray Kearney and others who are expert on Legionella give their advice. I have seen Legionella cases, but I have seen them mainly from airconditioning or what is suspected to have been airconditioning exposure rather than anything to do with sewage.

So, I am unaware of the technicalities of the survival of Legionella on surfaces such as, say, carbon filtration systems. I do know that, as a doctor, if significant numbers of Legionella become airborne, then the likelihood of susceptible people developing serious illness and possibly dying is increased, but beyond that I have nothing to say about the presence of it in sewage, the prevalence of it on the filter or the life cycle of Legionella.

The Hon. JAN BURNSWOODS: Could I come back to another point of interest to me. On page 8 you refer to evidence of the increase of chromosomal damage. It is in the section where you are talking about possible effects on workers. I have an interest in this because I gather you are involved in testing people in the West Ryde area in relation to chromosomal damage.

Dr DONOHOE: Yes.

The Hon. JAN BURNSWOODS: I have been hearing quite a bit about the testing and so on there.

Dr DONOHOE: What I am referring to is similar type of testing but it was carried out, from memory, on South American workers with pesticides. Chromosomal damage testing is a means—

The Hon. JAN BURNSWOODS: So you do this sort of testing, do you?

Dr DONOHOE: Well, I do not do it. The laboratory does it. I request chromosomal damage testing in people whom I suspect have been exposed to chemicals or agents which have damaged chromosomes.

The Hon. JAN BURNSWOODS: They are referring to you as actually doing the testing.

Dr DONOHOE: No, I do not do the testing.

The Hon. JAN BURNSWOODS: That was partly why I asked you before about your local practice.

Dr DONOHOE: The testing was done in a NATA [National Association of Testing Authorities] accredited laboratory. The assessment of the meaning of chromosomal damage is a little more difficult than that. There is usually a low rate in the population at any time. It is part of being alive that we damage our chromosomes but where it increases to a very large percentage of cells affected, one has concerns about future cancer risk.

Now that is all that can be said at the moment. It does not mean the person is sick or not sick. Usually chromosomal damage is associated with potential disease outcomes 20 years in the future, not at the time of exposure.

The Hon. JAN BURNSWOODS: I gather the laboratory that has been doing that testing has been closed down?

Dr DONOHOE: Not closed down. They did not renew their lease. Until they do, we now have to have the cells prepared in one laboratory by the cytogeneticist.

The Hon. JAN BURNSWOODS: This is the South Australia—

Dr DONOHOE: Yes, Judy Ford. She was unable to make a living from the laboratory and, so like many businesses in Australia right at the moment, has taken the rationalising approach of running the business herself and having another laboratory prepare the samples. The testing is still done and can still be done.

CHAIR: Is this relevant to the question at hand?

Dr DONOHOE: No. The point that I was making here was this was a paragraph on the healthy worker effect showing that the selection process of people working in an industry is very, very different from community exposure. The healthy worker effect has this paradox, that people who work in risk industries appear to be healthier than one would expect, yet their death rates are much higher than one would expect, and this is the case with sewage treatment plant workers. They appear to be healthy at the time they are working. They have twice the standardised mortality rate.

There was a study done and published only two years ago showing that although they self-select, those workers who become sick over time tend to leave the job and be replaced by others who are apparently healthy. The end result is that those who are apparently healthy bear the risk and eventually pay the price for the exposure, and that makes comparing a community population to a working population a very dubious idea.

The Hon. JAN BURNSWOODS: Would this be related to your rather strange comments on page 14?

Dr DONOHOE: I have strange comments?

The Hon. JAN BURNSWOODS: Definitely. The one that suggests that wastewater collected from outside the locality would seem to pose a greater health hazard than wastewater produced within. I wonder about perhaps those workers in the western suburbs of Sydney. We heard evidence from someone yesterday suggesting that sewage from the western suburbs might come to the North Shore.

Dr DONOHOE: I do not think that this is so much a class distinction as locality of pathogen. We each in our own time adapt to our own pathogens. This may even go back to your question about what has happened with the vents that are dotted around Sydney. Children who are brought up in a community where certain things which are pathogenic to other communities are common develop a tolerance and do not seem to become sick with them. If you shift the sewage of those people to an area where the people are not immune-capable for that same pathogen, illness rates rise in the other community but not in the community that has them as a local and available pathogen. And this has become especially apparent in Third World countries where we go to try to turn their immunology into the same as the western immunology only to find that people become sickened with what we consider normal organisms. They become sickened with our normal organisms but we certainly become sickened with their parasites.

The Hon. JAN BURNSWOODS: Would you expect this to become a problem at Scott's Creek even in the venting of gases?

Dr DONOHOE: It depends where the current origins are. My concerns were also that there are going to be occasions where the wastewater may be contaminated with industrial waste as well. So we are not a society well versed in the idea of not putting things down sinks and not putting things straight into the sewers. We traditionally have our industries that save money by dumping stuff straight into the wastewater.

The Hon. JAN BURNSWOODS: But surely in relation to this particular thing everything you are saying is so broad and so speculative and might and could and may.

Dr DONOHOE: Tell me another way of saying it another way. If there are no data, anybody who tries to be specific is being anti something.

The Hon. JAN BURNSWOODS: I come back to the existing vents and the existing overflows.

Dr DONOHOE: I am sorry, I missed the last part of your question?

The Hon. JAN BURNSWOODS: I keep coming back to the existing vents and the existing overflow at Scott's Creek. All of what you are saying, for instance, about the possible harmful effects of wastewater generated in another part of Sydney, would clearly apply now?

Dr DONOHOE: Yes, they could, and I would support you if what you are calling for is a health survey of the people there to find out if their health has already been impaired. I think that is sensible.

The Hon. JAN BURNSWOODS: So we should survey the whole of Sydney?

Dr DONOHOE: I think if you have found an area where there is exposure occasionally to raw sewage and overflows there is a responsibility to find out whether harm has already been done to that community. I do not have any problem—

The Hon. JAN BURNSWOODS: But is not the point of the storage tunnel to remove those overflows from the whole of Sydney Harbour?

Dr DONOHOE: And for the whole of Sydney I do not even have a problem. For the whole of Sydney this may be good. Localising risk is not a thing that benefits everybody equally. We may well have a better sewage system. We may well have a better storage system but we may well also put the risk on one community rather than the whole community. That is a political decision. Very often decisions are made to place one community at risk rather than to spread the load. It is a valid decision. It just needs to be made verbal.

The Hon. JAN BURNSWOODS: But it already has a vent and an overflow.

Dr DONOHOE: And I am saying that that is a bad situation. That should not be the gold standard against which further interference is allowed. There is an alternative, which is to fix what is broken, but do not put a vent right next to the school. I am not saying do not fix what is broken. I think that from everything that I have seen, the video that I have seen—

The Hon. JAN BURNSWOODS: So your argument is we address the whole of Sydney, if not the whole of the world?

Dr DONOHOE: No, I am saying that to place the burden of risk on one community by unusual placement of a vent that is untested and where the outcomes are not known by anybody, by Sydney Water or any expert that you have listened to—

The Hon. JAN BURNSWOODS: But your research does not reveal that; it does not enable you to say that.

Dr DONOHOE: I can say the risks are not known because I have reviewed the literature that says the risks are not known.

The Hon. JAN BURNSWOODS: You cannot find anything that talks about the risk. You cannot produce anything that documents it?

Dr DONOHOE: I have just talked to you about the documents that do show it.

CHAIR: Dr Holmes in her report of September 1999 says that a study of health effects in the vicinity of a sewage treatment plant by Johnson and others in 1980 concludes that there is no significant health effect to communities that live in the area. Dr Holmes concludes that as a result of such studies she considers the vent at Scott's Creek to be safe. Johnson's study describes the residual area as being at a distance of 350 from the plant. Do you consider this to be a fair comparison to a vent located 80 metres from a school? That was her study.

Dr DONOHOE: I have addressed this on pages 18 and 19 of my report. That is the quote that I gave you in my introduction. The primary difficulty in designing a definitive health watch is the lack of a significantly large sensitive population, that is young children whose immune defences against infectious diseases are still developing that reside close enough to the source to receive high doses of aerosols. It is the precise report that I addressed in my introduction. The authors note the insensitivity of their study, the likelihood that their study would not find problems which truly did exist. Their bemoaning the lack of a school close enough to a sewage treatment plant is precisely the matter that I am addressing. We are about to make a decision about creating the very experiment that they bemoaned lacking but would never have thought of creating.

The Hon. JAN BURNSWOODS: You are not suggesting Scott's Creek is a sewage treatment plant?

Dr DONOHOE: No, I am saying that there are going to be aerosolised pathogens, and that is highly likely to occur, and if we were to say, "Let us take the Johnson study," let us take it in its full form. Kerry may have read the abstract. The abstract gives a summary, which is very similar to what you have said. The full paper says that the limitations of this study are that it is insensitive, the distances that are being looked at are greater than 300 to 350 metres and there is no targeted sensitive population. The paper came to the conclusion that although no epidemics would be likely to occur, one cannot exclude the health risks at a lower level. And I concur with that paper but I do point out to you that the authors state in the paper that they need a school close to a vent or a sewage treatment plant to come to a better conclusion, and I am simply saying that it is not sensible for us to be the experiment that they said in 1979 would be nice.

The Hon. J. F. RYAN: Could I be fair to Sydney Water and say they probably would agree with the proposition that the best of all worlds would be to remove the sewage overflow and not have a vent. For example, they have created exactly that situation at Tunks Park. That appears to be some

indication that that is probably what they believe to be the best. What they say is that the barrier in the way of creating that situation at Scott's Creek is essentially $30 million, which they believe they would better spend in other parts of Sydney addressing other environmental issues that are more likely, on the balance of probabilities, to have greater health impacts. Do you have any regard for an argument that runs in that fashion?

Dr DONOHOE: I have a regard for it except where the group of people who you are taking risks with are children. I know that these decisions are not based on science; they are based on politics. The science is only supportive of the decision making; it is not the decision itself. Now, in this area I am saying there is a black hole in knowledge of risks, and especially risks with children, and if there is to be an error, it should be an error on the side of increasing safety for the children. Were this an old persons' home, I would be more amenable to that argument because, on the whole, old persons such as senators live less long than 10 year olds, five year olds and newborn babies. Therefore, the consequences of a poor decision are usually lost within 20 years rather than paid for 50 years further down the line. But I have little time these days for saying that what we consider an acceptable risk to our children will go ahead when we have made such appalling decisions on acceptable risks to children throughout our history.

Children do not have a voice of their own. They do not know what cause and effect is in these circumstances. And if we have any obligation, it is to minimise the risk to children, not to adults. Adults can move. Children are stuck in that school.

The Hon. J. H. JOBLING: Doctor, in some cases it would be fair also to say that you need to err on the side of caution because medical science may require at least 20 years before a causal effect does in fact show up and you can then prove or disprove the theory?

Dr DONOHOE: There was a paper done five years ago called the half-life of truth in medicine which decided that no doctor ever gives up his prior-held opinions. The half-life of truth is the half-life of doctors. And effectively we wait for doctors who hold one belief system to die before we change our attitudes. But it is true that when we turn our attention to what are the risks we may be looking at subtle risks but we may be looking at important risks. We have had acceptable risks. We see children typically treated with asthma and bronchodilators and drugs. It is now abnormal for a child to be healthy. More than half the children are medically treated in Australia. Now, this is the result of a number of acceptable risks one after another. There is no doubt that every choice was made. The net effect is not good.

The Hon. J. H. JOBLING: At the end, the cause is still being worked through to determine is there a major factor.

Dr DONOHOE: Yes, and I would fully support a view that a vent located in another area with good data gathered would be absolutely wonderful. In the world literature it would allow us to move forward and say is this safe or not in the future. I am not suggesting that that means it be put near the school. I am suggesting that a surveillance of the pathogens of the aerosols of the number of actual events of overflow be carefully undertaken when it is situated elsewhere, and if in five years time we can come back and say we have done the homework and we now know that it is safe, we now know that the pathogen rate is low, that the chemicals are not released, I would be perfectly happy to sit here before the Committee and say that I would have no problems with this. But given that there are no data to base that on, the erring should not be on the side of putting the children at risk; it should be on the side of minimising the risk to children.

The Hon. JAN BURNSWOODS: Dr Donohoe, Mr Ryan's question reminded me that you may not be aware that four members of this Committee were on a select committee inquiring into the same subject in 1997, so we have heard quite a bit about it. At that time one of the options that was put forward instead of the tunnel and the vents that we are talking about, including the Tunks Park one that Mr Ryan referred to, and in fact was being put forward by the Liberal Party, was that instead of the tunnel we should have sewage treatment plants, one at Lane Cove, one in that Scott's Creek area, et cetera. To what extent do your comments apply to sewage treatment plants instead of the tunnel and the vent?

Dr DONOHOE: Sewage treatment plants? I have taken a tour of one. I have a lovely video of it. Local sewage treatment plants seem to be more controllable than large-scale structures such as this. Now, for what it is worth, sewage treatment plants may, if they were managed at a local level, get around a number of the complaints and problems that I have on which I lack data, because there is more work done, there is more literature.

The Hon. JAN BURNSWOODS: The proposal at the time was for four sewage treatment plants instead of the tunnel?

Dr DONOHOE: Yes, and what I am saying is I cannot come to a conclusion on either view but we do have more data an what happens with sewage treatment plants than we have on structures such as the tunnel. Now, it does not mean that I would prefer one over the other. In either case you would want to be able to balance risk benefit and cost benefit. So I would not have a problem about which decision is made. In any event, whether it was a sewage treatment plant or a vent, I would be suggesting that a distance considerably separated from a school would be the minimum standard. And a sewage treatment plant I have no doubt the whole community would agree on whereas with the vent there is this capability of placing a vent, which most of the time would seem to function normally and without problem, close enough to a school so that when an unusual outcome occurs the school is placed at risk. You would not place a school near a sewage treatment plant because the smell would get them, as I found out on my tour.

CHAIR: Thank you very much for your patience.

(The witness withdrew)

RAYMOND KEARNEY, Academic and Associate Professor, Department of Infectious Diseases, University of Sydney, sworn and examined:

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Professor KEARNEY: Yes.

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

Professor KEARNEY: 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 accede to your request and resolve into private session. But I should warn you that Parliament may override that decision at any time and make your evidence public. Do you have an opening statement?

Professor KEARNEY: Thank you, Mr Chairman, just very briefly. In relation to some of the confusion that appears to have arisen as a result of the association with the claims of Legionella disease and to my name particularly in relation to Professor Kerr, I should explain that Professor Kerr phoned me several weeks ago to simply ask the question can Legionella organisms grow in sludge and under what circumstances.

The response to that kind of question was simply to talk about the biology of the organism itself without any real reference to the detail to the vent stack at Scott's Creek. Although I knew that his inquiry was in that context, at that time I had no knowledge whatsoever of the venting system and, besides, his questioning on the phone was not related to the venting.

The Hon. R. S. L. JONES: Are you aware now of the type of filter that has been proposed at Scott's Creek?

Professor KEARNEY: Yes, I am. I understand it is an activated charcoal filter which has impregnated in it certain components to allow it to be more effective as an odour absorbent, in particular hydrogen sulphide. I am rather concerned, hearing from the representative from DUAP this morning, that charcoal filters are used in hospitals in Sydney for the removal of bacteria.

I confirmed my own belief that such is not the case by ringing Susan Gregg, who is the Infection Control Officer of Sydney Hospital, and her information is that charcoal filters are not used for the removal of bacteria or viruses. They are not designed for that purpose. They are designed, however, and they use them for the purpose of removing noxious gases, such as those that are found in hospital situations.

The Hon. R. S. L. JONES: Is it possible for the filter to pick up viruses and so on incidentally during the course of its operation or would most of those viruses and bacteria be vented, do you think?

Professor KEARNEY: The question of the microbial content of the gases needs to be qualified in relation to the so-called filtration process. The term filtration is a misnomer. It is misleading in this context. Filtration implies holding back a residue and the filtrate that goes through is, for its purpose, clarified, but if you are asking me the question, are the filters used to remove microbial content of the vapours for the purpose of sterilisation, I would have to respond and say emphatically, no, that they do not.

The Hon. R. S. L. JONES: What did you tell Professor Kerr when he asked you whether Legionella can grow in sludge and in what circumstances?

Professor KEARNEY: My knowledge and experience goes back as far as the Wollongong tragedy where 44 persons were infected, nine of whom died. Having followed up personally the report and inquiry on that, it is very clear that the organism, Legionella pneumophila, and some of its

subtypes flourishes in areas where there is a large organic base. In that particular setting they found dead seagull bodies and so on in the airconditioning units on top of the pharmacy building some 50 metres away from the intake of the building in which the people were exposed.

So, to answer your question, Mr Chairman, the organism flourishes best at lower temperatures, about 28 degrees centigrade, where the virulence is increased. However, outbreaks or cases have occurred from showers in psychiatric units where the temperature is rather warm but not hot, and under those conditions the organism can survive under washers where there is organic material and so on.

It is interesting, and this is a point I raised with Professor Kerr, that where there is a shock in the system such as cleaning, such as a water mains break, there can be more of these organisms after than before because the sediments and the organic materials have been disaggregated, liberating more organisms into the free water medium.

The Hon. R. S. L. JONES: So is it your view that Legionella could actually flourish inside the tunnel and do you know what temperature the tunnel will be on average throughout the year?

Professor KEARNEY: Well, I would imagine, being in a cool area insulated underground, the temperatures would be round about between 21 and 28 degrees centigrade. I would be estimating that.

The Hon. R. S. L. JONES: What is the lowest temperature Legionella will grow at?

Professor KEARNEY: You are asking me the temperature it grows as opposed to the temperature it survives in. There is a difference and it is important to make that distinction here. It will probably not grow to the point where large numbers will occur under 20 degrees centigrade but it will certainly survive under that temperature.

The Hon. R. S. L. JONES: Do you know whether or not the Legionella could survive, thrive, grow, in the activated carbon filter?

Professor KEARNEY: Given the right circumstances where there is a build-up of organic material as a result of residue trapped in those filters and in the event of irregular cleaning and in the presence of moisture, my answer would be yes, on the grounds that organisms will only multiply if the nutrient is in solution. Organisms will not grow on this table unless milk is spilled. Nutrients can only be delivered to microorganisms in solution. So, this filter, as I understand, will be moist.

Secondly, it will be highly nutritious. Thirdly, I would imagine the pH would be round about neutrality. Although there is sodium hydroxide mentioned impregnated in the filter, I understand that sodium hydroxide is not released into the medium to make it alkaline.

The next point would be that these organisms thrive under conditions which are not too salty, not too sugary, and these conditions would be favourable to the growth of the organism.

The Hon. R. S. L. JONES: You would be aware that the vent will be venting actually 20 to 30 days a year approximately. Presumably in between those times the filter will obviously be resting or not being used at all I presume. Would it be the case then that Legionella would grow in the interim period, and when there is a heavy storm event when there is a very large volume of air being forced through, would there be a possibility of venting out, as it were, the Legionella from the filter?

Professor KEARNEY: I would say so, yes. It would be much like the breaching of a whale where you have got aerosols generated as a result of pressure behind wet surfaces. Yes, I would say there would be aerosols generated under the circumstances in which the descriptions have been given.

CHAIR: How far from the actual vent do you think that people, sensitive recipients, would be affected by it or perhaps have an opportunity to inhale those, and would there be sufficient in your view with the knowledge you have for people to be affected adversely?

Professor KEARNEY: Mr Chairman, I am rather concerned that there is a preoccupation with Legionella. There are other organisms as well that are more important but, to answer your question, for Legionella infections to arise, first there needs to be a reservoir where the organism is, there needs to be an amplification system—that is in this system the opportunity to multiply—and there is a dissemination of the organism via the pressure being exhausted or the vent being exhausted out of the stack at, I understand, a rate up to eight cubic metres per second. So it really depends upon how far that infectious aerosol drifts, and that is determined to some extent by the prevailing circumstances and so on.

CHAIR: What are the other organisms?

The Hon. J. H. JOBLING: Could we just check which other pathogens the professor would perceive as being important?

CHAIR: Would you just continue with your answer. The Hon. J. H. Jobling also has the same interest. What are the other organisms that you would have concern about?

Professor KEARNEY: Judging by the average age of persons in this audience I would say about 30 to 40 per cent of people in this audience are already infected with the organism helicobacter pylori, which infects the stomach. That organism, when it infects, colonises the person virtually for the rest of their life. It predisposes those persons to ulcer formation and in certain circumstances to gastric cancer. That is documented. What is not well known is the epidemiology of that organism. So 30 to 40 per cent of the people here will be contributing to the sewage organisms which we know are in the stomach only. We know nothing about the epidemiology, the transmission. We do know that in developing countries the incidence of that infection is very high in children because of their exposure to non-sanitation, open sewerage and so on, and there is speculation that the route is via contaminated sewage.

CHAIR: Are you suggesting then there could be a risk from the ventilation of this particular organism?

Professor KEARNEY: It is just another organism, Mr Chairman.

CHAIR: And are there any other organisms which you have concern about?

Professor KEARNEY: Yes, there are other organisms. May I take leave to table a document?

CHAIR: We already have the document, apparently. It is tabled, thank you.

Professor KEARNEY: And may I also take leave to table this document?

CHAIR: That is tabled too, the stylised concept drawing.

Professor KEARNEY: The article which has been tabled is entitled "Evaluation of the environmental impact of microbial aerosols generated by wastewater treatment plants utilizing different aeration systems". It was published in the *Journal of Applied Microbiology* in May this year. I have tabled this document for a number of reasons. One is it provides some data to indicate what is likely to be in the atmosphere above the water in the sewage. This is talking about open wastewater sewage treatment where there is mechanical agitation for the purpose of aeration.

In this tunnel, the filling will be at times when there is a rainstorm of unknown duration. The pounding and the turbulence and the detergent in that water will free up particulates liberating more organisms in the water medium and the generation of the aerosols in the supernatant, or the atmosphere, will be very significant.

This article here documents the fact that where there is in an open area and where there is a mechanical agitation, the colony forming unit count above that site is approximately 2,000 colony forming units per cubic metre. What the article shows is that when that drifts—and they measured up to 20 metres away—the counts of Staphylococcus aureus were very high, and, more importantly, 40 per cent of those strains of Staphylococcus aureus were coagulase positive, implying they are pathogenic,

so to answer your other question, Staphylococcus aureus of known pathogenicity is yet another organism.

I point out, Mr Chairman, if it is inhaled, a few organisms just inhaled, they themselves will not cause infection necessarily, but they start multiplying and produce a carrier state, particularly in the nose, and from there they can disseminate to other people, to food and to conditions which can give rise to further infection. So I am just simply putting to you that a situation like this where the article documents that high counts of a pathogen such as Staphylococcus aureus can be found, where they measured, 20 metres away from just the drift of the wind blowing over this surface, which was turbulent, equates very well to what you have in this tunnel at Scott's Creek.

The Hon. J. H. JOBLING: Staphylococcus aureus, Professor, was the major problem at most hospitals after surgery and the cause of major infection and it is fiendishly difficult to treat.

Professor KEARNEY: You are absolutely right.

The Hon. J. H. JOBLING: Can I put to you a proposition that you would have the same effect of drift in the tunnel as it starts to fill moving the air up the length of the tunnel as the air is displaced by whatever the fluid is, whether it is supercharged sewage or diluted sewage?

Professor KEARNEY: Absolutely.

The Hon. J. H. JOBLING: And would it be fair to say that as the tunnel recedes over the 36 hours approximately that I understand it takes to empty, there will be pockets of residual water, wet sandstone on which the residual parts can well lodge and proceed to multiply?

Professor KEARNEY: Absolutely. More than just residual pockets. That entire surface area in that tunnel will be contaminated. The organism Staphylococcus aureus is very resistant. It will survive and it will multiply under those conditions. Remember, that is a highly nutritious medium. Sewage contains protein of human origin as well as a whole host of other things.

The Hon. J. F. RYAN: Does whether it is light or dark make a difference, though?

The Hon. J. H. JOBLING: I just want to finish this. Could I just put to you that in evidence this morning it was put to us that the tunnel after it empties will not be flushed, in fact, until the next filling with raw sewage. What effect would you suggest to us, or is there a mechanism—if it is a long period and the multiplication may have occurred—that the flushing will have and how can this be overcome? Is there a method to reduce the venting of what are serious pathogens?

Professor KEARNEY: By definition, the term flushing means to remove some sediment, and something that has not been put very clearly to the Committee is that if this is going to be a holding period and solids and sand and contaminants settle out and compact at the bottom of that tunnel, then the purpose of flushing is mainly to remove the liquid, but you need much more force—you almost need a bulldozer eventually—to remove that particulate sediment, which will compact with time.

The Hon. J. H. JOBLING: So would you perceive, then, a flushing mechanism being the tunnel refilling with some form of sewage as being an effective method of flushing?

Professor KEARNEY: Provided the vent stack was closed off.

The Hon. J. R. JOHNSON: Associate Professor, are you aware that for at least 75 per cent of the time that the vent is operating ambient air will be blended with air from the tunnel and will generally dry out any condensed moisture? Does this mean that your assertion that the accumulated water remains in the carbon media between operating cycles is not correct?

Professor KEARNEY: Sir, I put it to you that this activity is occurring during stormy weather and what comes out of that vent will not be sterile air. It will not be sterile, dry air. The idea of sucking in humid atmosphere through the outside inlet and blending it, to me, is not a drying process, but on other occasions when dry air is brought in and when there is no moisture in the containers, yes, there would be dry air coming out, but we are dealing with a period when there is stormy weather,

where there is high humidity, which is being sucked into the system, put through an already moist system, so where does the drying occur under those circumstances?

The Hon. J. R. JOHNSON: If I could just follow up on that, Chairman, Associate Professor, are you aware that the fans will operate some time after the completion of venting and will pass fresh air through the carbon filters?

Professor KEARNEY: The fresh air undoubtedly is coming from outside and what is being done is after that period of greatest risk there is a purging. That obviously will carry a lower risk. That will happen, presumably, at the end of the time when that high pressure build-up from that flooding of that tunnel is released, and then when the tide goes out, as someone said, that is the time, as I understand it, when the purging of the system with fresh air begins. That, presumably, will have a lower risk, but a risk will be there.

The Hon. J. F. RYAN: Were you present in the gallery yesterday, Professor Kearney when somebody was responding to a paper you had written in which they said, in essence, that some of the assumptions you had made about health risks from the tunnel were based on an inadequate understanding of how the tunnel operates? Would you like to respond to that?

Professor KEARNEY: I most certainly would. In making right decisions one needs to have, first of all, a knowledge base; one needs to have the ability to weigh up that knowledge in the light of a proper understanding of the causes of the effects. I have been teaching medical students and dental students for over 28 years, and science students, in the area of infectious diseases.

Infectious diseases encompasses not only microbiology but the host element as well, so we deal with immunology; we deal with the epidemiology of infection; we deal with modes of transmission; we deal with the symptoms; we deal with the treatment, the diagnosis, control prevention. I am familiar with all of those factors, and many, many hundreds of medical students have come through our department in that period of time who would recall the lectures and the prac work on Legionnaire's disease, gastrointestinal infections, respiratory infections, so I believe I do have a knowledge base. I do believe I have the capacity to weigh up that information in the light of a proper understanding of causes and the effects and make a proper decision. Dr Stephen Corbett was saying that academics are not the same as perhaps those who work in a different setting. Well, I put it to you that one can apply the converse.

The Hon. J. F. RYAN: I think the other thing that Dr Corbett was saying was that some of the things you were concerned about would no longer be of concern if you understood exactly how the tunnel operated, and I have forgotten the exact detail but I think it had something to do with you may not have been aware of how the tunnel was flushed and it was dry periodically and it was dark and those sorts of features. Would that change your mind?

Professor KEARNEY: The fact that it is dark is conducive to low sanitisation. When organisms are out on the surface and exposed to ultraviolet [UV] light there is sanitisation. On a cloudy day UV light is absorbed into the cloud and organisms survive longer on the ground. I wonder if Dr Corbett has considered those sorts of elements in this. On a cloudy day when these emissions are being distributed and drifting perhaps up and down the valley encroaching upon residential areas and so on, then I believe there is a risk.

The Hon. J. F. RYAN: Have you read what I have as Appendix B? It is a report by the Department of Urban Affairs and Planning on health effects of the Scott's Creek vent. Essentially its conclusion is that, first of all, most of the bugs that are likely to be infectious have got to be usually ingested in some way or other; they are not usually airborne and the one or two that might be are so heavy that they are unlikely to make it across the valley to the playground in any event. And, finally, if all of that were in fact the risk, the current conditions whereby sewage is basically aerosoled at the moment from time to time into the valley is so much worse than whatever might come from the vent that the new arrangements have got to be an improvement.

Professor KEARNEY: Well, that is speculation. What we are looking at here in a six-metre diameter tunnel is an enormous volume of contaminated atmosphere, which is going to be burst out of a one-metre stack vent into an area which I do not believe will compare with what is happening now.

The situation is somewhat static. Sewage that is simply puddling and pooling is not such a problem for respiratory infection. It is when a child plays in it and then transmits the contaminants to the mouth that the problem emerges. But here we have being propelled out at eight metres per second an enormous volume of contaminated air. Does that compare with the current situation?

The Hon. J. F. RYAN: I think Sydney Water in response to the enormous volume of contaminated air says that the Scott's Creek tunnel only comes on stream at a fairly late stage of the filling of the tunnel, during which time an opportunity would have occurred to essentially purge the tunnel of the previous air that had been there and that what we were getting was basically air that was likely to have come into the tunnel during the course of the storm.

Professor KEARNEY: No, the point I was making before was that as that filling occurs and that tumbling and that turbulence occurs it is the contamination of the atmosphere at that point in time. It is not the displacement of what you are calling the cleaner air that is the problem; it is that build-up under pressure arising as a result of the aerosols being produced into an atmosphere above a highly turbulent culture medium. As these authors have shown and published just recently, there is a demonstrable count, and might I emphasise that that count is an underestimate, a gross underestimate, because the organisms in sewage have not yet all been cultured—perhaps only one per cent of them have been cultured. We do not know what we have got in there and all we can do is culture what is culturable and what will grow under those conditions. It was not so long ago when today the most common cause of gastritis in the Sydney area caused by Campylobacter jejuni was isolated and grown. My point is that there are organisms in there that you can see when you stain a smear but when you try to culture from that medium you only get a few.

The Hon. J. F. RYAN: Would they be organisms that are already present in an existing sewer pipe?

Professor KEARNEY: In the sewage of a sewer pipe, yes.

The Hon. A. B. MANSON: On the basis of the theory that every sewer pipe in Sydney will be discharging highly contaminated air, if that is correct, why has that not caused any major illness with these 20,000 stink pipes?

The Hon. J. F. RYAN: I was going to ask a similar question myself.

Professor KEARNEY: That is a very good question. The answer would be, well, has the Department of Health monitored that incidence? We have regular outbreaks of gastroenteritis. We have regular cases of food poisoning where the food can look nice, taste nice and smell nice and still cause food poisoning such as by Staphylococcus aureus. My point is that all that is monitored to a degree is the incidents that turn up at some of the hospitals. A lot of them are self-limiting where the patient does not go to hospital or does not see the doctor. So it is not recorded.

The Hon. J. H. JOBLING: Just to clarify the point, in looking at the pathogens that you are trying to culture, you have indicated to us that there are a great number that at this stage have been unsatisfactorily cultured so, therefore, we do not really know at the end of the day of all those other pathogens, whether they turn out to be pathogenic organisms or whether they are not?

Professor KEARNEY: You are absolutely right. We can only assess the pathogenicity of what we can culture. The rest of it is a black box, sir.

The Hon. J. H. JOBLING: We have to wait for time and science to hopefully advance.

Professor KEARNEY: Let me remark that in gastroenteritis, 20 per cent of the cases of gastroenteritis, the cause is not established. One might ask, well, is there other organisms we cannot culture responsible for some of those 20 per cent.

The Hon. JAN BURNSWOODS: Point 2 of your submission guesses that venting will occur between 125 and 150 days per year. That is contradicted by all the published documents and the evidence given on oath by Sydney Water which says between 15 to 20 days a year. If the rest of your evidence is then based on those figures, does that then mean you should retract your conclusion?

Professor KEARNEY: No, I understand your point. That comment was written to indicate that when I first read that report, it was very ambiguous to understand whether it was one or the other. I followed that up and checked it out to find, in fact, it is between 20 and 30 days only. So, in answer to your—

The Hon. JAN BURNSWOODS: Fifteen to 20 days.

Professor KEARNEY: The figure has been given up to 30 days. In response to your comment, yes, I have made that statement to illustrate the fact that the statement is ambiguous in that particular report.

The Hon. JAN BURNSWOODS: My question is really about whether the difference, now you know the figure that is given, does that change your conclusion?

Professor KEARNEY: No, none whatsoever. The problem is, where there is a sudden surge of large volumes of contaminated atmosphere over even a brief period of time can fill that area under the prevailing conditions of rain, low cloud, in a burst of venting that will carry a risk and that is all I am saying. If, indeed, that happened more regularly, then I would say it would be derelict on the part of the statutory bodies to not acknowledge that there is a very, very high risk if that was happening every day throughout the year, but obviously it is dependent upon the heavy rainfall which is not a daily event.

The Hon. J. R. JOHNSON: What efforts did you make to appropriately brief yourself on the operations of the tunnel?

Professor KEARNEY: I guess, sir, you are referring to the report of my comments in relation to Professor Kerr. Under those circumstances, as I pointed out earlier, that was simply a comment made in a brief conversation to talk about the biology of the organism. It was not in the context of me weighing this up in the knowledge of the venting processes and, therefore, it was not relevant for me to ask that kind of information because it was not demanded of me to respond in those terms.

The Hon. J. R. JOHNSON: Have you seen the video of the overflow?

Professor KEARNEY: I have not seen that video, no. Does it have any relevance to what I have said so far?

The Hon. J. R. JOHNSON: It may.

Professor KEARNEY: Mr Chairman, may I comment in relation to Dr Stephen Corbett's query that he did not understand what I meant by cumulative effect. I am absolutely astonished. What I mean by a cumulative effect is that an adult breathes over 24 hours 18 cubic metres of air. The cumulative effect is what happens, not by breathing one cubic metre of air that contains a defined concentration, but what happens at the end of 24 hours of breathing that concentration of air and the next day and the next day?

What Dr Corbett did not appreciate that what was raised at the recent workshop at which he attended and contributed and I attended and contributed in relation to particulate matter in the air is the fact that the EPA and the Health Department ignored the cumulative effects of these sorts of emissions. What I am putting to this Committee, Mr Chairman, is that the cumulation of breathing in contaminated air is a significant factor in considering the health risk.

The Hon. J. R. JOHNSON: Is it a fact that you do not have any real knowledge about how the tunnel operates?

Professor KEARNEY: Next question.

The Hon. J. R. JOHNSON: If you do, who briefed you?

Professor KEARNEY: Could I refer you to a diagram—

The Hon. J. R. JOHNSON: Yes, I have it.

Professor KEARNEY: Which is a stylised concept, sir, a drawing to illustrate the principles of the microbiology and the risks. It is reduced down to a teaching format so that we identify the most important elements we are considering. It is not my duty, nor is it my business, to become an engineer. What I have here is a tunnel that is surging under pressure, generating aerosols, that is supposedly to be pre-filtered and then going through this activated carbon system that we know is not microbial. I am simply addressing the microbial issues here, sir, not the mechanical operation of a tunnel.

The Hon. J. R. JOHNSON: Have you visited the site?

Professor KEARNEY: No.

The Hon. J. R. JOHNSON: So you have not been down the tunnel?

Professor KEARNEY: No, I have not been down the tunnel. Do I need to be down the tunnel to weigh up information?

The Hon. J. R. JOHNSON: I just asked the question, that is all.

The Hon. J. F. RYAN: We have been and we are none the wiser.

The Hon. A. B. MANSON: Your submission reiterates the published research that potting mix is a medium that allows Legionella to flourish. Given that many residents in Sydney would often expose themselves to potting mix, do you also conclude that these residents will fall ill to Legionella?

Professor KEARNEY: Thank you for that question, sir. I have been an adviser to the Gardeners Association in which they sought advice about the risks associated with exposure and handling of mushroom compost or potting mix compost which has, on a number of occasions, been responsible for transferring Legionella longbeachae, a different organism, and has caused symptoms similar to Legionella pneumonia. So my response is that under those circumstances and under the aerosols that are generated with a hose, it is possible, as has been demonstrated, for some of those aerosols to come up and be breathed from a contaminated source.

The Hon. A. B. MANSON: So would you recommend to the residents of Scott's Creek not to use potting mix?

The Hon. J. F. RYAN: It is a different bug.

Professor KEARNEY:. As I mentioned earlier, sir, making wise decisions is about having a database, a knowledge base and weighing it up in the light of a proper understanding of causes of the effects. In this circumstance, potting mix, as I understand now, has been so treated commercially and processed commercially that the risk is reduced. So I would say to the residents of Scott's Creek, "Go ahead and enjoy your gardening."

The Hon. J. H. JOBLING: But at the same time, Professor, there is a very clear warning on the packets of potting mix relating to sludge and the treatment thereof on how you handle it, the question of if it is dry, the air venting from the packet when you tear it open and the question of dampening it down. Am I not correct?

Professor KEARNEY: You are absolutely right.

The Hon. J. F. RYAN: You might not necessarily give it to your kids to play with.

The Hon. JAN BURNSWOODS: Are you aware that there are a number of sewage vents in Sydney that have flowing rates close to the capacity of Scott's Creek which are next to residential properties and have been so since the 1920s and there is no evidence of Legionella or any other bacteria associated with those? Does not the cumulative risk also apply to these green vents?

Professor KEARNEY: You must understand when we are talking about Legionella of the kind that is transmitted by airconditioning units, and I assume you are transferring it to this stack model, the risk is determined by the condition of the recipient, the condition of the person in that area. If that person is compromised, an asthmatic with corticosteroids, a recipient of transplants and is on immunosuppressant drugs, then the risk would be higher. I simply do not know how many transplant patients live around your ventilation stack.

The Hon. JAN BURNSWOODS: I am talking about stacks elsewhere in Sydney which have existed since the 1920s with an environment comparable to Scott's Creek. Do we have any evidence that the cumulative risk you are describing has produced any of the illnesses you were describing?

Professor KEARNEY: My answer to your question is that if there is, I am not aware, but that does not mean to say such persons have not been infected or affected. It depends upon the health conditions of the people in that area.

The Hon. JAN BURNSWOODS: Do not you think we would know by now?

Professor KEARNEY: Not at all.

The Hon. JAN BURNSWOODS: Eight years later?

Professor KEARNEY: Not at all.

The Hon. JAN BURNSWOODS: You do not think that within the last 80 years we might have guessed somehow or other or someone might have?

Professor KEARNEY: If there is one patient with Legionella infection—

The Hon. JAN BURNSWOODS: No, I did not just name Legionella. There is a complex of things that might be associated with the vent?

Professor KEARNEY: Part of the problem is that many of these infections are self-limiting. A person gets food poisoning. They have symptoms of diarrhoea and in most cases it is away and gone within a day or two and that is the end of the story. There is no record of it.

The Hon. JAN BURNSWOODS: Why would we not have noticed an increased morbidity or mortality amongst people living alongside of these things over 80 or something years, or 105 years? It seems very unlikely that somebody would not have started to twig that the undertaker was coming quite often to 57 Marrickville Road or whatever.

Professor KEARNEY: Let me respond to your question with a question. The World Health Organisation has declared that every hour of every day 2,000 children under the age of five die of diarrhoea-related disease. We do not have 2,000 or those rates of children dying in Sydney every day of the year. Why? Because we have preventive measures, chlorination of water, sanitation; we have immunisation; we have pasteurisation of milk; we have all of those health measures which minimise the risk to the point where in a society like this finding out the outbreaks and epidemics is something which is newsworthy.

The Hon. JAN BURNSWOODS: So the answer to my question is no?

Professor KEARNEY: Because no-one has searched that evidence. If there were children dying at that rate it would be—

The Hon. JAN BURNSWOODS: You do not think people would have noticed when the structures we are talking about have in some cases been there since 1894 and in other cases since the 1920s? We know their address, we have photos of the houses next to them, we know the persons who have lived in those adjoining houses over all those years. You do not think somebody might have noticed.

The Hon. J. H. JOBLING: They could have built up a resistance.

CHAIR: That is the last question, by the way.

The Hon. JAN BURNSWOODS: I think I do know what the answer is.

Professor KEARNEY: Might I simply qualify the answer. There are certain diseases which are notifiable. Many of these diseases are not notifiable by law. When we get statements on a monthly basis of the incidence of certain infections there is no address given of the particular person who has presented with the illness. All we get are numbers. So one would have to undertake a research project to trace the person back to the residential address to see whether there is a stack nearby. We would have to add them all up to see whether there is a relationship. I am talking about probabilities here.

CHAIR: Thank you very much.

The Hon. J. R. JOHNSON: I need to place some questions on the notice paper.

CHAIR: Please do that.

Motion by the Hon. J. F. Ryan agreed to:

That the two documents tabled by Associate Professor Kearney, the stylised concept drawing and the extract from the *Journal of Applied Microbiology*, be accepted by the Committee.

(The witness withdrew)

PATRICK THOMAS REILLY, Visual Merchandising Company Operator, and Mayor of Willoughby City Council, 280 Eastern Valley Way, Middle Cove, sworn and examined:

CHAIR: In what capacity are you appearing before the Committee?

Mr REILLY: As the Mayor of the City of Willoughby.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Mr REILLY: Yes, I have.

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

Mr REILLY: I am now, as of five minutes ago

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 accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Would you like to make a statement?

Mr REILLY: Yes, thank you very much indeed, Mr Chairman. I would like to say that Willoughby Council has been involved with this project since the release of the EIS in September 1997. The council had no argument at that time with the project as it was proposed in the EIS, being very supportive of its own to clean up Middle Harbour.

The council first became concerned with outcomes of the project when it was announced by the Alliance at the Scott's Creek Community Liaison Committee meeting that the volume of air that was to be vented at Scott's Creek had increased. Since that time, council has continued, in conjunction with the community and with the support of the community, to try to have negotiations with Sydney Water, including up to the level of Managing Director Mr Alex Walker, with delegations to the Minister for Sydney Water, the Hon. Kim Yeadon, and in relationship to court action to prevent commencement until settlement was made to reduce people's concerns, and eventually we had to go into mediation, which we still find recognises that the health hazard factor is still unsettled.

Over that period of time, I can say that the Council of the City of Willoughby has had unanimous support from all councillors in its actions and we have engaged independent consultants, lawyers, seconded staff, and we have now committed well over $250,000 to try to change Sydney Water's plans. That is, of course, taking into consideration a separate amount that has obviously been put in by the community via such organisations as Glenaeon School, which I believe is something in the vicinity of round about $70,000.

Quite frankly, Mr Chairman, what we are concerned about is that the whole process has been very disappointing to Willoughby City Council. The process with Sydney Water, the Alliance, to a certain extent DUAP and, from the latest I have seen and heard, the Department of Health saying that its role is not to advise Sydney Water, has concerned us greatly and we believe there has been a great case of being hidden behind the interpretation of the EIS legislation to push a project through that has not abided by the spirit of the EIS process.

The truth is that unless council and the community had insisted on an REF being submitted to DUAP for the design changes to the tunnel that resulted in the issue of venting at Scott's Creek, then Sydney Water and the Alliance would have ignored that part of the process. Council now, and I will say this quite clearly, has a very poor view of the EIS process and sees it as a flawed process. This has resulted in council now arguing to become part of the design process in any major State Government—and I stress that again, any major State Government—infrastructure projects being planned in our local government area.

I know you have probably heard everything over the last day or so but I just refer those that are on this Committee to our submission and the supporting commentary that is there where we have

said in relationship to your terms of reference that the points we have been concerned about are the areas of health and odour risk to the community. Council poses a question in the current climate of the community expectation of public infrastructure works to be free of environmental risk: what does significant mean? It is not defined in any of the reports by the experts.

When we go over to a point, it is Willoughby City Council's contention very much that for the specific venting regime that will be created at Scott's Creek the evidence does not exist that will guarantee no health or odour risks and, hence, the precautionary principle should apply.

It is Willoughby Council's contention that Professor Kerr's warnings regarding legionellosis need to be heeded and that his conclusions are based upon the use of and construction of the tunnel to the original EIS. This seems to now be a conclusion based on incorrect baseline data and it is now sensible that the precautionary principle should be applied.

On to the 1(b) factor—the ability for the vent to meet ambient air quality standards and licence requirements during the operation under all circumstances. There again, council has real doubts as to the abilities of Sydney Water to meet its responsibilities pertaining to the above. It is council's view, as has been graphically illustrated at every stage of this project, that Sydney Water has not been thorough enough in their detailed research and design to provide the community with any sort of confidence that the vent will be safe.

I also go down to the fact that it is Willoughby Council's contention that the community can have no confidence in Sydney Water or the EPA or the Government to regulate the emissions from the vent. In fact, it appears there will be no licence conditions of any meaning applied to the operation of the vent. And, finally, with 1(c)—the roles and responsibilities of bodies accountable for community health impacts and monitoring and maintaining ambient air quality standards—council, again, is unsure who will be responsible for ensuring that air quality standards are maintained. I will not go into that any further because you have quite a deal of data in that regard.

I go to 1(d), where you have asked about the appropriateness, measurability and reliability of the licence conditions associated with venting. The council is extremely concerned that the only monitoring that it appears will occur will be detection of odour by individuals in the community. There does not appear to be any method of measuring any risk to health from the emissions.

As just stated, council is in agreement with the community that the Government should undertake a full health study on the long-term effects of this vent should it proceed to operation. And I stress again in that regard, particularly given what I have heard was said yesterday by the Health Department. We were given a letter that was put forward when we sought it recently through the honourable member for Willoughby from the Hon. Bob Carr, and under his own hand he wrote back and said the view is supported by the Department of Health. That view was the same as the Waterways Advisory Panel report of the proposed Scott's Creek vent—that it is environmentally acceptable, poses minimal health risk to the local community and represents a substantial improvement on the current environmental conditions in Scott's Creek valley.

This view is supported by the Department of Health following their consideration of the potential risk to public health from the tunnel vent emissions. Now, that is from a letter, and it is stated here that the public health risk from the emissions is considered to be very low and a considerable improvement on the current situation where the public is exposed to uncontrolled raw sewage overflows. And that was from the Premier to the member for Willoughby on 30 June this year when it was sought, so it seems to be a bit of contradiction in that regard.

If I can just go back to the points regarding consideration of a report on permanent alternative options, if anything, preventing the vent being situated at Scott's Creek, there may be options, we believe, as council and from our involvement, that have not been placed on the table which could be explored once any restrictions regarding the commissioning of the tunnel by a certain time are removed. That has been a very strong feeling within the affected community, not only just through the Glenaeon school group but also the residents of the city of Willoughby and, finally, to consider and report on the implementation of the recommendation from previous parliamentary inquiries and reports from the Northside Storage Tunnel.

Council funded 50 per cent of the mediation process between Sydney Water and the community of Scott's Creek area and the final mediation report has been referred to in that submission, as I just said. The result of the mediation is very plain, with agreement between the parties very much on the following point, and I think this is where a lot lies in it and that is, it is accepted that the community believes there will be a health risk from the operation of the vent. That belief has been reinforced by the inability of the expert panel to agree on this matter.

Now, in summary, Mr Chairman, the thing that concerns me greatly, if I can read from a letter I received from a constituent in regard to this who is not immediately affected but will be affected or their concerns, and they are more concerned about the planning processes being abused, and that is really what it has got down to:

> All members of Parliament should be alarmed that no proper check was enforced against its own statutory authority concerning such abuse. I go back to the story about the environmental impact statement of September 1997 where it did not describe or quantify the air discharge at Scott's Creek vent. In fact, the hazard analysis did not show any volume of air coming out of Scott's Creek vent. Secondly, the review of the environmental factors of June 1998 removed the vent at Tunks Park because the community there did not want it.

There was absolutely no mention that it was going to go to Scott's Creek as such:

> The effect of this action would have had an increase of the air to be exhausted at Scott's Creek. Why did Sydney Water remove the vent at Tunks Park without considering the effect this would have had at Scott's Creek?

In December 1998 the Alliance advised Scott's Creek community that the diameter of the Scott's Creek tunnel spur would increase from four metres to six metres—quite a difference. They assured us there would be no increase in air volume. I know I have an Irish name, and there are terrible jokes said about those sorts of things, but I find that very hard to be able to comprehend, an increase of four metres to six metres and not see something bigger come out of it.

In May 1999 an REF for Scott's Creek detailed the changes which showed an increase in the size of the filters to cope with the increase in the air volume. The planning processes have been abused and I think it is great that we do have the opportunity through this presentation here today to be able to put these points across. One could really be forgiven at the end of the day to say that this whole exercise really could have elements of premeditated negligence, and that is in the opinion of the person who sits here and it is my opinion that I can be left with nothing else along those lines.

I think that if we are looking into this further to the degree that we are, we should also be bringing in the Auditor-General on the matter because he should now know what trouble is being stored up in terms of future litigation against the government of the day if that is allowed to proceed. It seems clear to us that such future litigation could be grounded in bad damages once the bad outcome which has been clearly predicted starts to occur.

The Hon. R. S. L. JONES: Have you had legal advice to that effect?

Mr REILLY: So far as I am concerned, I am saying that under parliamentary privilege.

The Hon. R. S. L. JONES: Have you had any legal advice as to possible damages claims later on?

Mr REILLY: That is something we would be looking towards. Can I just conclude, Mr Chairman, and it is a conclusion at this point of time as to Willoughby Council, for an on behalf of the people of the city of Willoughby. Can I just say that, where we stand at this stage is very simply that we want to see, and it is our contention, that this inquiry recommend to the Government that the operation of the tunnel to the extent that the vent at Scott's Creek is required to operate not proceed and that a redesign be undertaken to resolve the issues of health and odour as identified by the community. I thank you for your time to hear me.

The Hon. R. S. L. JONES: Are you contemplating action by the council as a result of damages in case of health costs or the school having to close because of the vent?

Mr REILLY: That is something we will take on board as we see it down the track.

The Hon. R. S. L. JONES: So you would be prepared to support the Glenaeon School and the local community in legal action?

Mr REILLY: That would have to be a decision of council, of course.

The Hon. R. S. L. JONES: How do you feel council would feel about that?

Mr REILLY: I have already given you an indication that council's position has been supportive to fighting this right through to where we are at the present time. We do believe that, as it goes further, we see greater gaps as to where there are going to be problems. I cannot be dragged in at this stage to say yes, we are, but I am going to say that to date we have supported the community.

Remember, that part of that community happens to be a very strong residential side of the area, let alone the fact that we do have a school community in that area and a number of those who attend that school are residents of the city of Willoughby, let alone the fact that it is close to three of the key open space areas that are relevant to the recreational life of the people of the city of Willoughby.

The Hon. R. S. L. JONES: What do you think the solution is to the problem of the vent?

Mr REILLY: Remove it. Can I just suggest to you that the most important thing is what I opened with. There was no opposition from Willoughby council or the community. It was actually welcomed to improve the situation with the storage tunnel. The change that came to the EIS and the way that it was done created that magic question, and the magic question very simply is, okay, what are the guarantees.

We still sit here in this Chamber today on the second round and say where are the guarantees. It is getting a little like the old painting of the Sistine Chapel, "When will it be finished", sort of thing. It is one of those sorts of circumstances, all laid down on the basis of the fact that this had to be finished by the Olympics. In each role that has taken place with it, and I have been involved with a number of them, it has been quite concerning that we just cannot get people to understand that we just want the EIS that was there before.

To answer your question, and I am sorry it is in such a long-winded way, take it back to what was originally planned, and there was no vent of that nature expected at that particular point.

The Hon. A. B. MANSON: Is it true that you were so concerned about the health impact of odours that Willoughby Council went to court to try to stop the vent at Scott's Creek?

Mr REILLY: We tried, as I said earlier on, to cease any occupation of the site until such time as it had been resolved and that is what we went to court on. We lost that in court because the judge, if I remember, and putting it in very basic terms just said that Sydney Water, he believed, had the right to turn around and meet their deadline of the Olympics.

The Hon. A. B. MANSON: So you lost the case or did you withdraw the case?

Mr REILLY: On that occasion it was advised to us to move along. In essence we did lose it, yes.

The Hon. A. B. MANSON: You did not withdraw it?

Mr REILLY: I would have to take that on notice to check again.

The Hon. A. B. MANSON: You might get back to us on that.

Mr REILLY: Yes, I will reserve my right to get back to you on that.

The Hon. A. B. MANSON: Do you have any confidence in the expertise of the Department of New South Wales Health in matters of public health?

Mr REILLY: I must say at this point of time, no.

The Hon. A. B. MANSON: What are you doing to protect the public health of people of your municipality?

Mr REILLY: Well, we are complying to the best of our ability, like every other council, with the laws of the State of this Government. But if they are going to take on board the sort of commentary I have heard in the last couple of days, I must say that I do not have a great deal of faith. If there is an element of doubt, if those laws are based on that, I would have to say I do not have a great deal of confidence. We do what we have to do as you dictate it.

The Hon. A. B. MANSON: What expertise or experience does the council have in the operation and management of sewerage systems?

Mr REILLY: The exact expertise I would take on notice and get back to you on, but I would go so far as to say that it fits within what is required by us under the Local Government Act and associated Acts regarding what a council is responsible for. But if you want specific qualifications of everybody associated with that, I would be only too happy to get back to you.

The Hon. A. B. MANSON: On what basis do you assert on page 2 of your submission that the tunnel will have conditions that will be worse than raw sewage?

Mr REILLY: Well, I have not got the full document with me because I did not want to take up any more of your time than I had to, but I will go so far as to say that I think the main thing that has been pushed is that at the moment with the raw sewage that is there, there is a natural flushing that takes place, but what Sydney Water is proposing is something we know nothing of in regard to the implication of another problem, and that is pollution of the air.

So what we are arguing is the fact that pollution of the air where you are breathing something in as opposed to something which has been, let us face it, more of a trial and test over the years—I have been living in the area for 48 years and I am 48. I am not dead yet, but at the end of the day, as far as I am concerned that has proven itself that the natural movement there, albeit good for the waterways and that is why we support having the waterways improved by a storage tunnel, but not to turn around and transport the problems that come from it through the air.

The Hon. A. B. MANSON: But you must be aware that sewerage vents in the municipality expel gases from the sewers that contain raw sewage.

Mr REILLY: I am not aware that happens.

The Hon. A. B. MANSON: There must be hundreds of them.

Mr REILLY: I am quite aware that that happens but not to the degree and the volume that we have put before us here.

The Hon. J. F. RYAN: Since you have plundered the mediation process I was just wondering did you have any comment about the actual process of the mediation? Was it long enough? Did you feel you were listened to? I understand there was an occasion when Sydney Water did not show up. Would you like to brief the Committee on that?

Mr REILLY: In our goodwill to make sure that all avenues had been approached in regard to this we got involved in the mediation and assisted in the funding of it instead of going into possible other directions. As you say, was it long enough? You know, it is getting a little bit like *Quo Vadis* or what have you. It could have been still going on now. But, no, I think it was probably round about the right length. Maybe it could have been a little bit less but I think the important thing that has come about with it is that we, at the end of the day, all came back to the same conclusion that what concerned everybody when the CLC were told originally that there may be changes to the vent and when the question was asked are there going to be health hazards the answer would not be qualified yea or nay. Now, when it has come down to the final side of it, at the end of the day that was confirmed actually from the mediation—still the same point.

The Hon. J. F. RYAN: Do you recall Sydney Water making an offer during the mediation in which they agreed to install an additional filter at the ventilation shaft and offered to make it higher as a means of taking the material to a higher level above the emissions, above the inversion layer? Do you think it was reasonable or unreasonable or on what basis did the community refuse that?

Mr REILLY: Still no guarantees. There were no guarantees of how you were going to be able to turn round and have this matter solved. You know, we are dealing with sort of nasty little germs in relationship to this that not anybody around this table, I am quite sure, at this point of time would be comfortable in having floating around them or the children. So at the end of the day it could have easily been sorted out early in the piece on this matter. It has been put to the Minister and the Premier. We want to talk to the Premier about it. I have just given you copy of a letter from the member for Willoughby about it, or quoted from it. At the end of the day the guarantees factor. You could make it as high at Centrepoint Tower and you are still going to get the same reaction from people, particularly where you have a school only a few metres away from it.

The Hon. JAN BURNSWOODS: I am sure they would be happy to have something as high as Centrepoint Tower?

Mr REILLY: I am sorry? Am I answering—

CHAIR: That is fine. It is just a comment made by an honourable member?

Mr REILLY: I am happy to answer the comment, but at the end of the day when you are looking at a situation where we are talking in this day and age about open space and places for people to enjoy the environment, you have not got a better one than around that part of the world. You have a school that is very orientated to that, you have a council and an immediate local community and you are going to turn around and up comes this. There are going to be questions about it and guarantees are going to be wanted..

The Hon. J. R. JOHNSON: Councillor Reilly, you said that the alternative in response to one of my colleagues was to remove it and revert to the original EIS. Is council therefore prepared to accept the vent as equivalent to the air that would have been emitted from a four-metre diameter tunnel?

Mr REILLY: Council's original EIS is what we stand by, Mr Johnson. That is what we stand by.

CHAIR: Thanks for giving your evidence.

The Hon. JAN BURNSWOODS: We may have to put some questions on notice.

CHAIR: You may.

(The witness withdrew)

PATRICIA JOY HARVEY, Company Director and Mayor of Mosman Council, Mosman Council Chambers, Mosman, sworn and examined:

CHAIR: In what capacity are you appearing before the Committee?

Ms HARVEY: As the Mayor of Mosman.

CHAIR: Did you receive a summons issued under my hand in accordance with the provisions of the Parliamentary Evidence Act 1901?

Ms HARVEY: I did.

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

Ms HARVEY: 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 would be willing to accede to your request and resolve into confidential session, but I should warn you that the Parliament may override that decision at any time and make your evidence public. Do you wish to make an opening statement?

Ms HARVEY: Yes, I will. Like Willoughby Council, Mosman is most concerned about the Scott's Creek ventilation issue. It could have actually happened in Mosman at Quakers Hat but it did not and that was fortunate for our community, but we certainly do not wish anything like that to happen to anyone in Sydney.

Mosman Council considers it a necessity for Mosman Sydney Water to embrace the precautionary principle in its decision-making process regarding this issue in accordance with its stated commitment to the principles of ecologically sustainable development.

The lack of full scientific certainty regarding the potential impacts on public health is reason enough for Sydney Water to be concerned and ensure that all such risks and hazards are removed. Have you considered that this is a tunnel in total something like 18 kilometres long, an average of six metres in diameter? At times after heavy periods of rain and infiltration of sewage, you can have this mass of water of that dimension simmering away in an anaerobic condition. It is very, very different from the other vents that occur where you have a normal sewerage system that is moving along and has oxygen provided to it at all times.

I would also like to make mention on the proposed duplication of the Northside Storage Tunnel. There are a number of specific recommendations which have not been implemented in that. For example, the future major capital works proposals by Sydney Water should be subject to a more rigorous independent and competitive assessment against other options available in the private sector, particularly the newer technologies.

I was in Queensland a couple of weeks ago and I was shown by the Mayor of Douglas Shire their sewage treatment plant, which treated all sludge for reuse as fertiliser, and all water. It is the wettest part of Australia, so they do not really need to be saving water but they did not want that to go out into the harbour so they are using it on their ovals and golf courses. The last time I was before this Committee it was certainly something that we were hoping would have happened on this occasion for Sydney.

Sydney Water's recent call for comments on its option paper for biosolids handing and transport demonstrates disregard for this recommendation. Information was presented for public comment that because a full range of options was not investigated and considered in a thorough and systematic manner the construction of Sydney Water tunnel be discontinued until there is a full and independent cost benefit analysis. Now, of course that is when I put the submission in.

The tunnel itself, after a fashion, is finished. Certainly, there will not be the commissioning of a number of parts of that tunnel until well after the Olympics so that it is not really meeting the

Olympic requirement, and so far as SOCOG [Sydney Organising Committee for the Olympic Games] was concerned they never asked for that. The second report on March 2, and this is from the Waterways Advisory Panel, details that it gave original support on the understanding that the tunnel would be lined and that a concrete invert would carry at least three conduits which would transport power, recycled water and sludge. These initiatives were included in the EIS, which was reviewed in detail in good faith by numerous parties, including Mosman Council.

The gazettal of State Environmental Planning Policy 54 provided for work for the purpose of the tunnel to be carried out without development consent, allowing Sydney Water to alter the design of the tunnel from its original concept as proposed in the EIS. Consequently, the initiatives proposed in the EIS, such as the tunnel lining, the concrete invert, the sludge pipe and the stand-by power supply for North Head, were removed from the project. These initiatives were used by Sydney Water to sell the concept. However, it begs the question whether Sydney Water had ever seriously intended to include them.

This is a very serious consequence for Manly Council, an adjoining council to Mosman, where they have problems with the sludge trucks taking the sludge to be dealt with out of Manly and through Manly streets. The amount of sludge that has been collected by Sydney Water at the present time from the works there is only something like 30 per cent, and they say that they intend to remove all sludge from the treatment works at Manly. That would mean that the removal of that sludge, either by truck or by barge, would necessarily create a threefold increase and I do not think that in this day and age that is suitable technology to force on any community.

There is just about one other thing that I think I would like to just remind people of because it has been Sydney Water's intent to go and close down eventually the ocean outfalls. Ninety per cent of wastewater is discharged to the ocean. In the driest continent on earth that is a very, very valuable resource and we do note that apparently there is provision now in the tunnel for the grey water but we cannot understand why there was not one as well for the sludge that is going to increase in value and the fact that on occasion when there is a blackout we will still have ocean falls from the cliff face at Manly. I think I have probably said enough, probably a bit too much considering the lateness of the afternoon. Thank you for listening to me.

The Hon. A. B. MANSON: Councillor Harvey, what expertise or experience does your council have in the operation or management of any sewerage system?

Ms HARVEY: We do not have a sewerage system of our own in Mosman but we certainly have studied very, very carefully the operation of state-of-the-art systems in other parts of Australia, as I have mentioned, and in other parts of the world.

The Hon. A. B. MANSON: When it rains, Councillor, what chemicals, toxins and pathogens enter your stormwater drains?

Ms HARVEY: All the ones that also flow through the sewerage system because Sydney Water's sewerage system is admitted by it to be leaking like a sieve. On a number of occasions that enters into our stormwater drains so that we have virtually the same pollution that you can get from one of the sewer overflows.

The Hon. A. B. MANSON: So there are similarities between the pathogens that enter stormwater drains and the sewer system?

Ms HARVEY: Yes, there are and, indeed, the problems for Mosman beaches are such—and this comes from work done by Beachwatch using enterococci—that a number of our beaches do not comply for half the time during the year.

The Hon. A. B. MANSON: Councillor, why does the council not use filtration systems on air vented from its stormwater drains to avoid risk of Legionella?

Ms HARVEY: I am sorry, we do not have that problem in Mosman because we do not have that vent, the same vent that they have at Scott's Creek.

The Hon. A. B. MANSON: You do not have any stormwater drains in Mosman?

Ms HARVEY: We have stormwater drains but you do not need to have vents for those.

The Hon. A. B. MANSON: Does the council have any evidence of outbreaks of Legionella as a result of the operation of its stormwater drains?

Ms HARVEY: I do not think we do, but we certainly do have occasions when people have had skin conditions and eye and throat problems. We do warn our residents not to swim at any of our beaches for at least three days and at other times at their own risk.

The Hon. A. B. MANSON: But in wet weather conditions, your stormwater drains would contain diluted sewage from sewage overflows?

Ms HARVEY: Yes, we would, and we do have evidence back in the 70s that Sydney Water asked Mosman Council if they could put the sewer into our stormwater drains as it was preferable to flowing into people's houses.

The Hon. JAN BURNSWOODS: You stated that you believe in accordance with the precautionary principle?

Ms HARVEY: I do.

The Hon. JAN BURNSWOODS: In accordance of that principle, do you think that if there is a risk to public health then all such risks and hazards should be removed.

Ms HARVEY: They should. That is part of the precautionary principle.

The Hon. JAN BURNSWOODS: Can you tell me if council has installed public notices at Balmoral Beach warning of the dangers of swimming after rainfall?

Ms HARVEY: Yes, we have. We erected them about four years ago when we discovered we had a lot of pollution on our beaches and we have maintained those and it states that everyone is warned against swimming for three days after rain and at any other time at their own risk.

The Hon. JAN BURNSWOODS: Would you agree that, in terms of what you have said about the precautionary principle, your council should in fact be closing Balmoral Beach on such occasions?

Ms HARVEY: If it was very bad and we knew. Unfortunately, you cannot know how bad it is using enterococci or faecal coliform testing until after the event, but certainly if I was down any of the beaches and you can tell by the look of the water, I would tell people not to go in.

The Hon. JAN BURNSWOODS: Has the council ever closed Balmoral Beach?

Ms HARVEY: Yes, we certainly have during very bad storm events when it is not just a matter of pollution, it is also the matter of huge waves. We can go and get a surge coming through Sydney Heads.

The Hon. JAN BURNSWOODS: What I am getting at is you seem to be arguing that Sydney Water should do things which your council is not willing to do, faced with the same risks from the same pathogens.

Ms HARVEY: But I am saying to you, with respect, that our stormwater drains are only conduits for Sydney Water's sewage pollution leaking from their pipes.

The Hon. JAN BURNSWOODS: I do not think it would be agreed that all of the contaminants of various kinds in stormwater drains are coming from Sydney Water sewage problems. Again, we are coming back to a question, I guess, of putting your money where your mouth is. If the council wants someone else to do something, we are interested in what the council does.

Ms HARVEY: The council certainly is doing a lot. I was out this morning showing people around to look at all our stormwater detention devices. We had the first one in Sydney.

The Hon. JAN BURNSWOODS: But, as you said in answer to Mr Manson, you had not thought, for instance, of putting vents on your stormwater drains.

Ms HARVEY: No, because I have not heard of any other councils that have them on their stormwater drains either.

The Hon. J. H. JOBLING: Would you agree with the suggestion that the microbiology of sewage, whether raw or stagnant and stormwater, would reasonably be expected to be radically different?

Ms HARVEY: Between the two, yes, I would because the stagnant is anaerobic situation and that is the real problem. We do not know enough and I have not read anything in the literature that I have had to indicate that stagnant sewage is not far more noxious, if you like, than the ordinary sewage.

The Hon. J. H. JOBLING: The comparison was simply between the two forms of sewage and the run-off in your stormwater system. That was the point that was made in questioning earlier. What I am asking you is do you agree for the microbiology of stormwater and the microbiology of sewage that one would expect to be radically different.

Ms HARVEY: I do.

The Hon. J. H. JOBLING: Would you agree that council has a duty to express the concerns of its residents and would the expression of that concern of the residents about what is happening in your area be the reason for your appearance before us today?

Ms HARVEY: Yes.

The Hon. J. F. RYAN: Why did Sydney Water agree not to have a vent at Quakers Hat Bay?

Ms HARVEY: I am afraid I do not know the answer to that. I think it was fortunate that maybe they felt that a larger vent further upstream would actually—thinking about it quite seriously now, it occurs to me that you would probably have a real problem when the sewer tunnel was full to have a vent at Quakers Hat because there would not be any air there except bubbling off the stagnant sewage, but there would not be any air at all. The whole tunnel would be full of sewage.

The Hon. J. F. RYAN: Do you think the people at Scott's Creek might in fact feel that they have been hard done by in that the people of Quakers Hat have a treatment virtually 100 per cent of what they want?

Ms HARVEY: It still worries me that they might find it necessary to have a vent at Quakers Hat and then we would be fighting to make sure that that did not occur.

The Hon. J. F. RYAN: How close was the proposed vent at Quakers Hat to residential houses?

Ms HARVEY: It was probably a matter of 100 metres.

The Hon. JAN BURNSWOODS: Under what circumstances do you envisage raw or stagnant sewage being held in the tunnel? Is it not true that the tunnel will be constantly pumping dilute sewage?

Ms HARVEY: I do not believe it could because the main NSOOS [Northern Suburbs Ocean Outfall System] line during a big storm event over four our five days will already be at capacity and they will not be able to take that extra amount. That is why it was designed to be a storage tunnel to pump out after the big rain event.

The Hon. JAN BURNSWOODS: My question was about raw stagnant sewage. There is a difference between the highly diluted stormwater with sewage in it in the tunnel because of a big rain event. You have suggested there is going to be stagnant sewage in the tunnel.

Ms HARVEY: There will be because the reason it is a storage tunnel, and it is storing that sewage, diluted though it may be, in an anaerobic situation—

The Hon. JAN BURNSWOODS: For how long?

Ms HARVEY: Possibly for five days because that is the sort of weather we get in Sydney. We get constant rains for four or five days. All the design sewer overflows at Quakers Hat, Scott's Creek and Lane Cove—

The Hon. JAN BURNSWOODS: So, when you use the word, "stagnant," for instance, you are talking about something up to five days?

Ms HARVEY: Yes. Then you can get another similar event and it can happen all over again.

(The witness withdrew)

(The Committee adjourned at 4.08 p.m.)