

# Government Environmental Noise Policy - A Personal Account of the Last 35 Years.

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## ABSTRACT

The problems and challenges of regulating environmental noise are surveyed with a focus on addressing dose/response relationships. The extent of government noise policy in NSW is discussed with reasons for the current structure and examples of its application. An account is given on the evolution of government policy since the 1970s especially for NSW from the standpoint of personal experience during that period, which includes the national approach to aircraft noise impact assessment. Aspects of policy development in that history are described with insights into the political background driving that development and the administrative difficulties faced by regulators, both in terms of the politics and the science. Specific examples are described that illustrate the results of policy and legislative application. This history provides a perspective on the current policy position in NSW and likely future issues and directions for governments and regulators are discussed.

## INTRODUCTION

This is a personal perspective on the evolution of government policy on environmental noise control since the 1970s. When I started working in this field over 35 years ago noise control policy was fairly crude and misunderstood; today policies have reached a high level of sophistication. My experiences are mainly about NSW but also include the Commonwealth regarding aircraft noise. Many of the policy principles covered here have been applied by other jurisdictions in Australia and overseas.

## POLICY PRINCIPLES

Environmental noise policies adopted by governments and regulators have always been promoted as instruments for protecting the public from high levels of noise. In that regard noise policy has been popular with governments as they represent a “good news” story. However the community has often misinterpreted these noise protection policies believing they will hear no noise at all from the offending source. So some people have become disillusioned with noise policy as they might still hear the source that they thought the policy should have silenced.. This is especially true for those individuals with a low annoyance threshold.

The mission statement of the NSW Environment Protection Authority back in the early 1990s was to protect the environment while supporting a prosperous and productive NSW. The message from the government then was that the cost of protection was limited to ensure costs of this protection did not adversely affect the state economy. For noise policy this meant that the noise level set as criteria could not provide total protection. The common compromise was a policy setting of a noise level that 10 per cent of the exposed population would

still be highly annoyed about. It also meant that the extent of mitigation had to be reasonable in term of its costs and benefits. Noise policy was therefore a balancing act between protection and costs.

There was also the challenge of overcoming the “one-size-fits-all” approach. In other words, can one policy setting be relevant for everyone affected? It is more difficult to set the safety limits for noise than for other environmental media because of individual variation in perceptions of offensive noise expressed as a noise level. Some people worry about the distant sound of crickets at night while others are not concerned by the roar of heavy road traffic right outside their windows. This range is from about 20dB to 60dB. The top level has 10,000 times the power of the bottom level. Can a policy provide protection for both sets of individuals? There is also the problems that people react differently to different sources with the same noise level. There is a well known scale of annoyance for transportation noise. Aircraft noise is more annoying than road traffic noise which is more annoying than rail noise. People are also more tolerant of moving sources (traffic) than of stationary sources (industry). So the background plus 5dB approach for industrial noise policy would be far too restrictive if that setting were applied to traffic noise. In addition, with stationary sources people are more tolerant of construction noise, which is temporary, than of operational noise, which is permanent.

So how does government policy tackle all these differing perceptions now and how did it evolve to this?

## THE THREE POLICY STRATEGY

There are basically three types of policy, one where a definite noise limit is imposed, one where determining a limit is based on a subjective test and one where a limit is negotiated drawing on a policy formula.

**Table 1.** The three types of policy

<i>Policy type 1</i>	Prescribed Noise Limits
Example	Limits on motor vehicles/locos
Enforcement	Testing facilities
<i>Policy type 2</i>	Subjective assessment
Example	A noisy party
Enforcement	Issue of Noise Abatement Direction by councils
<i>Policy type 3</i>	Negotiated limit guided by a policy formula
Example	Operational limits of a coal mine
Enforcement	Audit and field compliance testing

Why does the government have this structure? The short answer is because this approach addresses a wide range of noise sources and situations and is enforceable. For example, we expect individual motor vehicles not to exceed a certain noise level. We wouldn't expect to be able to drive a noisy old bomb with ineffective mufflers down a suburban street at 2am waking up the neighbourhood. Compliance can be easily tested at a noise testing station. It can be controlled also by regulating vehicle design which is executed by the Commonwealth. The same approach applies to locomotives in NSW, vehicle horns, lawn mowers and some power tools.

The second policy plank, the limit based on a subjective test is common with neighbourhood noise issues such as a noisy party. It is not practical to limit a party's noise to a set noise limit. It would never work and in any case the regulator (a local council) is likely not to have the means to measure noise. But it is practical to expect certain common sense mitigation measures to be followed such as limiting the duration of noise or holding the party in a location where the neighbours are few in number or far away. Enforcement officers can assess whether noise is offensive or not from answering a series of questions and then following advice on how to interpret the answers. This practical approach applies to many situations such as recreational vessels, car sound systems, noisy garden tools during the day and off road vehicles. The subjective nature of the test has been a challenge for the courts in the past but the concept is now well established.

The third policy plank and perhaps the most important for acoustic consultants is the negotiated limit bound by a policy formula. This works for major transport and industrial sources such as rail noise, road noise, construction noise and industrial/commercial noise. But because the community's dose-response relationship is different for each there is a corresponding separate policy setting for each. Therefore there is a road noise policy, a construction noise policy and an industrial noise policy in NSW. (DECCW,2011;DECC,2009; EPA,2000).

These noise sources, and in particular transportation, affect the most people and can be the most contentious politically. The policies produced by the regulator (the

NSW government environmental agency) tread the fine line between protection for the community and preserving the viability of industry. In fact, industry support for the policy was largely due to an understanding that the policy would seek to limit their costs through imposing only mitigation that was feasible and reasonable as well as providing regulatory certainty. (See Table 2)

**Table 2** Costs versus protection

Low cost	Minimal mitigation – community protected only in worst case situations
Medium cost	Targetted mitigation to control impacts to reasonable levels for most people
High cost	Comprehensive mitigation to achieve source noise as better than background plus 5dB and perhaps inaudibility under all operational scenarios.
Negotiated cost	Community trades away some noise protection for other benefits

Industry in lobbying against higher levels of protection might threaten job losses due to excessive costs which they know can baulk governments into inaction on noise control. Less protection on the other hand can stir affected communities to organise protest groups that are reported on by the media and can cause political fallout. Noise as a pollutant attracts a lot of media attention.

Avoiding all this is a key aim of this third plank of policy. The NSW Industrial Noise Policy (INP) has two criteria applied in tandem. Firstly a practical level of protection is set. Noise higher than this level is likely to seriously affect at least about 10 percent of the population that is exposed to the subject noise source. In noise policy terms you can't please all the people all the time. The 10 percent figure derives from studies with transportation noise at a level of 55dB(A) (Hede&Bullen, 1982) but has been translated for stationary noise levels as background noise plus 5 dB when measured at the receiver. This level is considered to correspond to the same level of protection. The second criterion is a noise cap that preserves amenity for particular land uses. This cap is stricter for residential land uses than for industrial areas, for example, reflecting the different expectations for each.

From the industry standpoint negotiations will occur with the regulator when its predictions show that this level of protection cannot be achieved. The regulator would then require mitigation measures be incorporated by the proponent but only those that are feasible (can be built) and reasonable (benefits outweigh adverse social, economic and environmental effects). This approach will limit industry costs. The outcome of this process seeks to find a balance in each case between community protection and industry costs. The holy grail is to keep the community happy while at the same time supporting industry prosperity. This situation is not easily achieved but is greatly facilitated by a policy element that provides for direct negotiation between the exposed community and the proponent as the community are in the best position to know what benefits they want in exchange for trading away some level of protection.

These types of policy are non mandatory in that they provide the process that leads to a negotiated noise level, which may end up being more lenient than a strict application of the policy. It is the negotiated level which becomes mandatory.

This is the position currently held by the NSW Government. But how did this come about?

## THE HISTORY OF POLICY DEVELOPMENT

In NSW in the 1970s noise was becoming recognised as a significant pollutant. It was a time when environmental awareness in general came to the fore. For noise this resulted in the drafting of the Noise Control Act which gave power to government bodies to limit noise levels and some power to individuals to pursue through the courts people who made offensive noise. But back then there was limited experience about how noise limits might work in practice. There was also misunderstanding in the community about what regulation of noise levels meant. This was exacerbated by an inability by governments to adequately explain how the noise assessment system worked. Aircraft noise assessment is a prime example of this. This became a big issue with Sydney residents in the 1970s and 1980s when the Commonwealth Government was pushing for the selection of a site for Sydney's second airport. The Australian Noise Exposure Forecast (ANEF) was established as the main method of aircraft noise assessment through work done by Hede and Bullen in the early 1980's. The ANEF contour lines on maps indicating forecast noise exposure of aircraft noise were widely publicised and land use planning decisions were meant to be made according to what side of a specific contour line a proposed development was on. The public's opposition to aircraft noise was made worse by their mis-interpretation of this result. For example some people believed that if the ANEF contour line ran down a residential street, houses on one side of the street would be affected by aircraft noise while houses on the other side of the street would not.

Another problem was the complexity of the methodology and lack of a clear explanation of it in lay language. At that time I was the public contact officer for the second airport study. People living near the second airport site would ask me what an ANEF of 28 associated with their site really meant to them. My best answer to them was to suggest that given specific wind conditions they go to a location that had a similar index value for current aircraft noise at Sydney Airport and experience what it was like for them- not a very scientific answer, not one with a high degree of success for accuracy in exposure levels but something the community could practically apply.

Noise was one of the main reasons why successive Commonwealth governments failed to find a second Sydney airport site within the Sydney basin. The same list of sites kept being recycled in the hope that upon re-examination the noise impact predictions might have reduced. Urban encroachment surrounding the originally proposed sites have only increased the predicted level of impact. The first second airport site was proposed in 1946 and only after 65 years has the government finally come to terms with the fact that any site within the Sydney basin will have politically unacceptable noise

impacts. During the 1980s I worked as the man on the ground advising the local communities near the proposed airport sites. I reported personally to the Minister for Aviation, Kim Beazley who wanted to know what issues the communities had so that the right response could be made. He knew that once opposition became entrenched making a decision would become very difficult and so it has proved. Noise policy for aircraft noise was of course subservient to safety. Air traffic controllers were meant to observe the noise abatement procedures in directing the use of airspace. The Long Term Operating Plan (LTOP) for Sydney Airport incorporated noise abatement procedures and the use of preferred runways. In monitoring the implementation of this policy actual runway and flight path use often bore little relation to the plan to the point that for practical purposes there was no strategic mitigation plan. Aircraft noise remains as a contentious issue, not surprising when Sydney airport is located so close to the centre of population.

In NSW in the 1970s the NSW Government agency with pollution control responsibilities was the State Pollution Control Commission (SPCC). It was a young and small organisation with a culture that maximised innovation and minimised the centralisation of power. This more collegial approach meant that line managers could make their own policy decisions ensuring a quick delivery of a product. As well there was recognition of the need for practically based guidance on noise control by the SPCC's small but professional noise cell. The organisation was therefore able to produce a very comprehensive collection of noise control policies to guide agencies using the Noise Control Act in a short space of time. This document, The Environmental Noise Control Manual (ENCM) (SPCC,1985) was written in just a few months but contained 29 separate guidelines (see Table 3) as diverse as motor sport, helicopters, concrete batching plants, inclinators and newspaper boy's whistles. It also contained a guide to the Noise Control Act, noise assessment and measurement procedures, a wealth of technical data and the process for determining limits for industrial noise. Because of its comprehensive nature it is still used by many practitioners, especially those in local government.

The next stage in policy development was to start addressing the root cause of noise problems: poor planning. The common situation is where residential developments are allowed to encroach on existing noise sources. Targetting this problem seemed *the* logical strategy to adopt and was touched on with the ENCM. However the 1999 NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA,1999) included this pro-active approach as a key component of a broader strategy. This covered lowering individual vehicle noise limits, community education programs and examining enforcement issues as well as setting actual noise criteria. This looked good on paper but there wasn't the political will to carry these measures through as an integrated approach including the planning system. Thus we continued to face the problem of fixing noise problems after they occurred in situations like encroachment of residential land use next to freeway corridors. The ECRTN's successor, the recently released NSW Road Noise Policy emphasised more strongly the need to apply good planning principles as the key proactive approach.

The message was that prevention was not only better than the cure, it was also cheaper.

**Table 3** – Policies contained in the Environmental Noise Control Manual (ENCM)

Recreational vehicles	Emergency generators	Motor sport
Aircraft	Blasting	Noise from shops
Public address systems	Road traffic noise	Domestic air conditioners
Sporting activities	Reversing alarms	Rail signalling systems
Open air entertainment	Rail traffic noise	Target shooting ranges
Helicopters	Mobile vendors	Garbage collection
Concrete batching plants	Pre-mixed bitumen works	Vehicle refrigeration units
Construction site noise	Vessel noise	Swimming pool equipment
Building vibration	Gas scare guns	Hail cannons
Pedestrian inclinators	Newspaper vendor's whistles	

The NSW environmental agency's powers extended to licensing all polluting industries and this included noise as a pollutant. If your industry was on this list and you did not have a license you could not operate. Industry was realising by the late 1980's and early 1990's that good noise policy could in fact assist them because it would give them certainty about the noise standards that they would be allowed to operate under. This meant they would not be exposed to unreasonable complaints by the community once their noise limits were on their license and they were in compliance. A result of this realisation was an industry push for a comprehensive industrial noise policy that addressed all their concerns. This included the reasonable and feasible mitigation approach, again encouraging better land use planning, allowing for negotiation between parties and taking account of temperature inversion as a factor that enhanced noise.

The then Environment Protection Authority took all this on board and in 2000 produced the NSW Industrial Noise Policy (INP). It was noteworthy for tackling the difficult policy area of noise enhanced meteorological effects. This meant that the policy quantified the required strengths and frequencies of temperature inversions that needed to be modelled for noise enhancement effects. Source to receiver wind was assessed in the same way. This part of the policy was necessarily complex but was a significant step forward that few other jurisdictions in the world had addressed in this way at the time. The INP remains as an important example of good, practical

policy work. It is about to be reviewed and expectations are that the revised product will use the experience of the 11 years of assessment work guided by the INP to tackle all of the flaws and problems that have arisen in the meantime.

Noise policy making was becoming more complex via a greater policy scope, expanded consultation, more research and more attention to achievability and enforcement. The regulator's challenge was to explain technical policy in detail to a significant cross section of lay people from government and industry. The many development steps shown in Table 4 partly explain why delivery of policy was taking longer. This included the political process with its change of ministers, government structures and priorities. A policy document in the 21<sup>st</sup> century was now subject to intense scrutiny especially by acoustic consultants because of its permanence as a working document and its application to every noise assessment dealing with that type of noise. Every word of the policy needed to be exact, accurate and unambiguous. In many meetings between the regulator and stakeholders words and phrases were agonised over in seeking an agreed position while at the same time being clear with the message.

Even so once a policy was being used on a day to day basis flaws came to the surface. This happened with the INP. Many advices called Application Notes were published to supplement the INP made necessary to clarify areas of misunderstanding caused by unclear passages in the original document or situations that were not covered at all. This may continue if policies become even more complex.

**Table 4** – Policy Development Steps

<ul style="list-style-type: none"> <li>Step 1 - Establish need;</li> <li>Step 2 - Scoping of project;</li> <li>Step 3 - Approval to Proceed;</li> <li>Step 4 - Initial consultation;</li> <li>Step 5 - Refining policy document;</li> <li>Step 6 - Economic assessment;</li> <li>Step 7 - Approval to release as a draft</li> <li>Step 8 - Draft released</li> <li>Step 9 - Detailed public consultation</li> <li>Step 10 - Analysis and integration of feedback</li> <li>Step 11 - Final version of policy</li> <li>Step 12 - Government approval</li> <li>Step 13 - Policy release</li> <li>Step 14 - Training and education programs</li> </ul>
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Good planning as the preferred strategic approach finally came of age when the planning authority, NSW Planning, joined the fray and decided to regulate internal noise levels for residences. NSW environmental noise policy was always about protecting the community by setting external levels allowing for enjoyment of one's property right up to the fence line. This approach didn't work well for residences built next to high volume traffic corridors where external levels were high with little scope for reduction. The NSW Government's urban consolidation policy encouraged high density residential development near major public transport nodes. This was fine as a way of reducing greenhouse gases but not good

for noise exposure. To address this the State Environmental Planning Policy (Infrastructure) 2007 (known as the Infrastructure SEPP) was introduced. It stated that for land near rail corridors or busy roads in excess of 40000 vehicles a day approval for a residential development depended on appropriate measures being taken in the building design so that a noise level of  $L_{Aeq} 35 \text{ dB(A)}$  was not to be exceeded in bedrooms at any time between 10pm and 7 am and other specified rooms at  $L_{Aeq} 40 \text{ dB(A)}$  at all times.

These were landmark noise criteria because NSW Planning, was in effect imposing improved building design and construction by specifying noise standards for buildings in situations where control of external levels was impractical. So the preferred pro-active approach to noise policy was gaining momentum. However this idea has taken some time to permeate local government as there still remains in some quarters a division between the planners and the environmental officers where occasionally the mentality of a “fix it after the event” approach remains. Yet councils are now generally changing their outlook with the old dividing line between planners and environmental staff evaporating as they discuss as a group how noise control can become part of better planning principles.

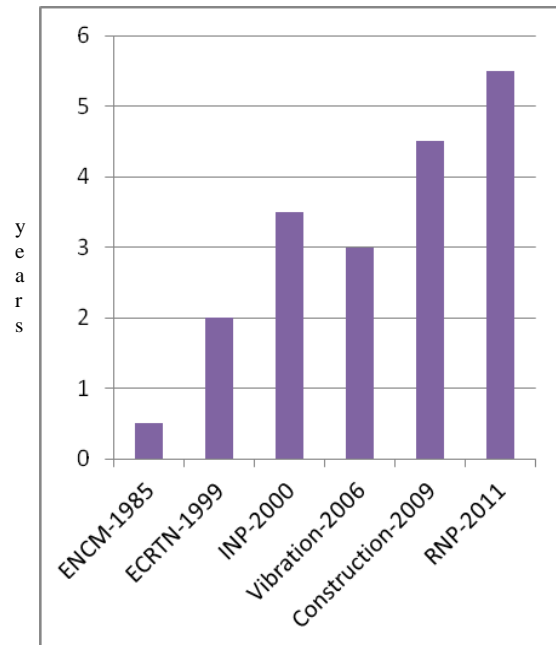
The policy momentum increased with the release of the NSW Construction Noise Guideline in 2009 followed by the NSW Road Noise Policy in 2011. The latter document was initially simply a revision of the old 1999 ECRTN but as it developed it became much more comprehensive. The development of both policy areas was characterised by large and time consuming consultation phases. Figure 1 shows how the time taken to produce policy is related to the date (measured from the time elapsed from stage 1 to stage 14 described in Table 4). Speedy delivery is an important principle with the current NSW Government. It means that future policy cannot continue to take longer despite the trend towards greater policy complexity. This implies the need for greater resources to be given to the job for delivery of policy to occur within a reasonable timeframe. So a degree of political will is needed, sparked by community and industry pressure to assist early delivery of new policy. This will be especially relevant with the upcoming review of the Industrial Noise Policy, with the original policy now over a decade old.

Slow delivery times can produce other difficulties. In 2006 the NSW environmental regulator produced a technical guideline for assessing human comfort levels for vibration, mainly an update on practices including triaxial weightings and the vibration dose concept for intermittent vibration; (DEC, 2006). It was based on the British Standard BS 6472-1992. However in the time taken to produce this guideline the British Standard was also being updated, eventually producing BS 6472-1:2008, “*Guide to evaluation of human exposure to vibrations in buildings – Part 1: Vibration sources other than blasting*”.

The NSW Regulator was aware that this might happen and so gave the guideline “interim” status. But it still meant that the guideline could be criticised for being out of date soon after it was published. The new British

Standard had changed the weightings for the vertical axis and applied the vibration dose value (VDV) approach more generally. One result was to increase source receiver distances to account for the changed weighting and comply with the new Standard. Compared to this level of compliance the NSW Guideline was less strict, a result not intended when it was published..

**Figure 1** – Time taken to produce policy



New South Wales has continually been the best resourced State for noise policy work. Most States have only one or two people dedicated to this task. NSW has a professional cell of 10 covering both policy and project assessment work and this has been the case for over two decades. Consequently a significant amount of policy guidance has come out of NSW which other States and even overseas jurisdictions have often adapted to their situation. The Province of Alberta in Canada has used policy ideas from NSW for their own policies such as Directive 038 the equivalent to NSW’s Industrial Noise Policy. NSW has been at the forefront of policy in some areas which has served government and industry well.

**NATIONAL NOISE POLICY**

The rate of progress in NSW has not been matched nationally apart from the area of vehicle standards and the noise component of Australian Design Rules. One reason for this is because it is much harder to achieve agreement from all the States and the Commonwealth about a policy and this process is necessary in a federal system such as Australia. State based policies are easier to produce as only one State needs to be satisfied but State based policies do not work well when they seek to control noise from items that can be imported from other States. This is because the law says that each State has to accept products from other States provided they comply with the laws of the exporting State, even though these laws may be far laxer than those of the importing State. A leading example is the effort by the NSW Government

in limiting noise for a range of noisy domestic tools such as grass cutters, air conditioners, chainsaws and leaf blowers. Some States do not have such laws and are free to import their noisy products into NSW.

For these noisy consumer products market forces can drive down noise levels through the use of product noise labelling so that consumers can make choices based on noise. This works only when all States and the Commonwealth can agree on a common approach.

This sounds both simple and logical to achieve but in practice it is a long bureaucratic process. Discussions have gone on for years both informally and more recently formally between all of the States, Territories and the Commonwealth through the Environment Protection and Heritage Council about product labelling but agreement has not been reached. Currently this process has slowed, (*per.com*).

## THE FUTURE

Where is noise policy headed? Up to now annoyance has been the key driver for setting noise criteria in government policy in NSW. However continuing research may show that annoyance is less significant overall than adverse health effects and there is mounting evidence that excessive noise exposure has a negative impact on health. However government policy makers need certainty as to both the relationship between a critical noise exposure level and the specific health effect that this noise limit is addressing.

The World Health Organisation's 2011 publication "Burden of Disease from Environmental Noise" surveys the current knowledge and indicates a range of specific effects. These include hypertension and ischaemic heart disease which includes myocardial infarction (heart attack), cognitive impairment in children, tinnitus and of course sleep disturbance. The WHO's 2011 study attempted to quantify the health burden and came up with the concept of "ability adjusted life years". These are potential years of life lost per year due to premature death and equivalent years of healthy life lost through being in poor health where the data can link these effects back to environmental noise exposure. The figures for Europe are astounding. The estimates are 61000 years for heart disease, 45000 years for cognitive impairment in children, 900,000 years for sleep disturbance and over a million years lost for traffic noise in Western Europe alone.

Imposing noise limits implies a mitigation cost. Governments need to justify this cost burden so the certainty of the nature of the effect needs to be pinned down. The importance of the health effect has to be established and compared with other health effects. Then the appropriate noise descriptor has to be identified that properly characterises that aspect of noise exposure most strongly featured in the dose response relationship and a critical noise level needs to be identified.

Achieving all of this is hard for policy makers as they also have to consider how such policy can apply to a target audience and what level of protection should apply more generally. Consequently a short cut approach is to put effort into developing policy settings that address sleep disturbance. We are further along the noise-health

policy path with this approach because with the body of research behind us added to a continuing research effort we are getting closer to a noise criteria setting. As well, the measurement of the extent of sleep disturbance is better established than specific health effect measurements. Sleep disturbance may be regarded as a general trigger for a range of health and well-being effects and so is very useful as an indicator. Sleep deficiency is linked to impaired performance, memory, creativity, judgement, immune system functioning and a heightened potential for accidents.

In 1985 the NSW EPA introduced a guideline in its ENCM based on work by Horonjeff in his 1982 paper *Behavioural Awakenings as Functions of Duration and Detectability of Noise Intrusions in the Home* of the  $L_1$  over 1 minute of the source not exceeding the background noise ( $L_{90}$ ) by more than 15dB(A). This was carried forward to the NSW ECRTN which also stated that the three sleep disturbance noise characteristics to consider were peak level, emergence above background or ambient noise and the number of events. Eleven years later the new NSW Road Noise Policy is saying much the same thing; that for intermittent night time traffic the sleep disturbance indicators are peak level, emergence and event numbers. The difference is that in those 11 years much work has been done including the WHO 1999 publication which set 30dB(A) as the recommended internal level for bedrooms at night, the Enhealth Council's 2004 report and the WHO 2009 report *Night Noise Guidelines for Europe* and a multitude of research papers backing up this statement and which is acknowledged in the new policy.

With the expectation that there will eventually be sleep disturbance criteria NSW noise regulators have ventured half way by applying the relationship of  $L_{A1} < L_{90} + 15\text{dB(A)}$  as a screening test which indicates whether the risk of sleep disturbance is significant or not. If it is then a more thorough assessment is needed including the three established approaches, maximum noise, emergence above background and number of events. This approach is stated in an Application Note which is part of the INP.

After all the effort in producing and enforcing noise policy is the environment any quieter because of it? Intuitively I would say yes when applied to regulated noise sources. Road traffic noise may still be increasing but perhaps at a slower rate, again in specific areas where there is mitigation. The future dominance of the electric car and reduced tyre noise may change all this in time. No studies on overall effectiveness of noise policy have been done. For the general environment this appears a difficult and perhaps unproductive task. What keeps noise policy work going is largely the political imperative of addressing noise issues for complaining communities. Health is likely to become a more significant driver of policy as well. The media interest in noise stories also helps to maintain the momentum.

So the future looks good for a continuing effort to improve government noise policy. People working in the noise policy field can look forward to some exciting challenges when the weight of health research leaves policy makers in little doubt that noise is a more serious pollutant than it has been regarded until now.

## THE LIGHTER SIDE OF POLICY

To conclude, no story about noise policy work is complete without the amusing anecdote and in this field there are many. I offer here five experiences that have come my way. These indicate the personal nature of environmental noise which is the only pollutant that can be strongly linked to homicide.

A truck driver burst into my second airport site office clearly distressed by the prospect of aircraft noise that might affect him in 20 years time. I had to ask him to speak up because of the roar of the traffic from the road in front of the office about which he appeared oblivious.

A consultant in assessing noise from a mine predicted to affect a local community suggested the best solution was to artificially increase background noise through white or pink noise generators to the point where the mine noise was masked. The media got hold of this idea and ran a cartoon depicting giant speakers surrounding the town.

In framing a regulation on noise from barking dogs a public submission suggested that noise could be controlled if each dog was limited to a set number of barks not to be exceeded and it would be the job of "bark counters" to enforce this.

A local council in Sydney contacted me for noise policy guidance about complaints they were getting from residence about the night time noise of their neighbour's love making.

Perhaps my best story concerns the noise limits set for a motorcycle raceway. The race track license holder, the operator of the facility, was keen to show us as regulators that he was complying with his license which included a prescription of 95dB(A) at 30metres for individual bikes under race conditions. A sound level meter had been set up at the correct distance from the verge of the track near the finish line. A motor cycle race of marathon proportions had begun. During the race the rider of a particularly noisy bike, obviously non compliant, was spoken to by the venue operator while in the pits. This warning did not seem to improve matters as the offending bike was just as noisy after the warning as before. The operator was becoming more agitated about the situation as the race progressed. Finally, on the very last lap of the race with the non-compliant bike near the lead he flagged it down when in sight of the finish line. To say that the motorcycle rider was furious was an understatement. He looked threatening. All the officials including us retreated quickly to the security of the control tower and locked ourselves in. Outside an enraged rider kept bashing at the control tower door until his colleagues led the distraught rider away.

The track kept its licence but was eventually defeated by the encroachment of residential development. For those dedicated people who continue to work in noise policy life is never dull.

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