

**INTERIM REPORT OF THE EXPERT MEDICAL PANEL  
TO EVALUATE THE KIMBERLEY CHEMICAL USE  
REVIEW RECOMMENDATIONS**

**FEBRUARY 2003**

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## **INTRODUCTION**

This interim report of the Expert Medical Panel [the Panel] aims to inform government of the Panel's progress towards meeting its objectives as articulated in the Terms of Reference.

The report covers the establishment of the Panel and its first meeting in November 2002; the Panel's analysis of the health concerns in the Kimberley as documented in the Kimberley Chemical Use Review; and actions initiated to obtain further information to address the Terms of Reference.

## **BACKGROUND**

### **Kimberley Chemical Use Review**

In August 2001, the Minister for Agriculture announced a review into the health concerns of former Agriculture Protection Board (APB) workers who had been associated with the use of 2,4-D and 2,4,5-T herbicides in the Kimberley region during 1975-1985.

Dr Andrew Harper was appointed as the reviewer, and submitted his report to the Minister in June 2002. The key finding of the Review was that illness did develop in association with exposure to the herbicides used in the spraying program. Symptoms of ill health amongst the 90 people interviewed were considered to be *probably* attributable to these chemicals in 13 cases and *possibly* attributable in 14 cases.

The report made 16 recommendations. Of these, seven were predicated upon a causal link between past occupational exposure to these herbicides and current illness. As Dr Harper's report was based on a descriptive survey, and as the known health effects of exposure to these herbicides did not support a causal association, further investigation of Dr Harper's findings was recommended.

The Expert Medical Panel was formed to advise government on these recommendations and a number of other issues, as described in the Terms of Reference (Appendix One).

### **The Expert Medical Panel**

The Panel has five members and is chaired by Professor Bruce Armstrong. Each member of the Panel was selected from a specialist area relevant to the health concerns of the APB workers. Members are listed here; a short statement of their qualifications and expertise is in Appendix Two.

Professor Bruce Armstrong, environmental epidemiologist

Dr Tim Driscoll, occupational epidemiologist

Dr Robert Kenyon, occupational physician

Dr Peter Greenberg, consultant physician

Dr Geoff Duggin, clinical toxicologist

## **PANEL ACTIVITIES**

The Panel met in Perth on 21 November 2002. Dr Duggin was unable to attend.

The format of the meeting was:

- Presentation by and subsequent discussion with Dr Andrew Harper to provide Panel members with insight into the process of the Review and its conclusions;
- Panel discussion of the Review and an analysis of the health issues documented by it; deliberation on the appropriate methodology to guide the Panel's decision-making;
- Consideration of the Terms of Reference and determination of subsequent action.

## **Key issues**

### *Exposure to high levels of dioxin*

Dr Harper believes that this cohort of APB workers was probably exposed to high levels of dioxin through the importation of 2,4,5-T with unregulated dioxin contamination into Western Australia. In addition to the circumstantial evidence set out in his report, he has drawn attention to the loss of relevant Commonwealth files and the pattern of muscle wasting (a known effect of dioxin) he had noted in several of the APB workers.

The Panel considered it unlikely that the APB workers were exposed to unregulated levels of dioxin. As described in Dr Harper's report, the chemical batches of concern were imported in the years 1969-1971, and there is no convincing evidence that contaminated herbicide was used in the period 1975-1985, the period covered by the Review.

### *Social causation*

Dr Harper argued for the payment of compensation to APB workers on the grounds of 'social causation' rather than a 'cause-effect association'.

Dr Harper stated that he did not have the scientific and statistical evidence to make a judgement of cause-effect association, and that it is unlikely that sufficient evidence will ever be available to prove a cause-effect association. However, a consistent and strong pattern of chronic ill health following soon after significant contact with the herbicides has been described and this should be sufficient for the provision of compensation.

Dr Harper quoted two reports in which 'social causation' had been accepted as the grounds for a recommendation in favour of compensation, in the absence of strong scientific and statistical evidence. These reports were:

- The report by the Senate Rural and Regional Affairs and Transport References Committee into Air Safety and Cabin Air Quality in the BAe146 Aircraft<sup>1</sup>.
- The Report of the Board of Inquiry into the F-111 (fuel tank) Deseal-Reseal and Spray Seal Programs, June 2001<sup>2</sup>.

#### *Toxicity of the chlorphenoxy herbicides*

Within the Standard for the Uniform Scheduling of Drugs and Poisons, three schedules are used for agricultural, domestic and industrial poisons - Schedules 5, 6 and 7. Schedule 5 is for substances with a low potential for causing harm; Schedule 6 is for poisons with a moderate potential for causing harm; and Schedule 7 is for dangerous poisons.

The chlorphenoxy herbicides are considered to have low toxicity; 2,4-D is scheduled as Schedule 5 and 2,4,5-T was scheduled as a Schedule 6 poison when it was last sold (prior to 1981). Any significant illness would be expected to be acute and not long term.

#### *Epidemiological issues*

The Panel decided that it should work as much as possible with the findings of the Review, rather than collect additional data. It noted that Dr Harper interviewed 90 people from the possible cohort of 321 former APB employees engaged in herbicide spraying in the Kimberley region and that every reasonable attempt had been made to locate and interview all these employees.

The picture presented by the Review is of a wide range of clinical symptoms in a group of workers who probably had substantial exposure to 2,4 D and 2,4,5 T. Although not specifically stated by Dr Harper, the possibility of the symptoms being due to Multiple Chemical Sensitivity needs to be considered.

#### *Community concern and individual distress*

The Panel was acutely aware of the harm to people's wellbeing and their loss of trust in government authorities that has reportedly occurred over the years since the spraying programs. The Panel sought to approach the work in a spirit of reconciliation and to foster a process of healing through a compassionate consideration of the issues brought to it.

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<sup>1</sup> Report by the Senate Rural and Regional Affairs and Transport References Committee, October 2000

<sup>2</sup> Chemical Exposure of Air Force Maintenance Workers. Report of the Board of Inquiry into F-111 (fuel tank) deseal/reseal and spray seal programs. Royal Australian Air Force. June 2001.

## **Scientific causation vs social causation**

The Panel is required by its first Term of Reference to *'carry out a formal evaluation of the finding by Dr Andrew Harper in his Kimberley Chemical Use Review that illness did develop among former APB workers in the Kimberley in association with exposure to herbicide sprays they applied between 1975 and 1985'*.

The Panel interprets the requirement for a 'formal evaluation' as being the provision of scientific advice on the likelihood that there is a causal association between exposure to the herbicides and reported ill health in the 90 workers interviewed by Dr Harper.

To provide scientific advice to government, the Panel is therefore required to consider the evidence documented in the Review and the extent to which it supports an association between herbicide exposure and ill effects on the health of the people exposed. The Panel recognises that formal statistical criteria for causation probably cannot be met in this situation. It notes, however, that a causal judgement takes into account other issues as well, such as temporal relationships and biological plausibility (as, for example, provided by similarities between the present reported health effects and those reported in other people exposed to these herbicides), which may allow a judgement of causality to be made.

In epidemiological studies, it is common to use death or documented disease as the end points of the study. In this case, the symptoms documented in the Review will also need to be used as the end points. While this is feasible, it does pose problems in interpretation, unless a strikingly unusual cluster of symptoms is identified. The symptoms reported to Dr Harper are common in all communities and may reflect a variety of disease states. Thus a judgement that they were probably caused by herbicide exposure will depend on their temporal and possibly quantitative relationships to exposure, their similarity in affected individuals and to patterns previously reported in other people with similar exposure to herbicides, and their severity in comparison with what is common in the community.

The adoption of 'social causation' rather than 'scientific causation', as proposed by Dr Harper was discussed. While the Panel felt that the standard epidemiological criteria for causality (as originally enunciated by Sir Austin Bradford Hill) might not be the most appropriate in this situation, the Panel's responsibility is to provide scientific advice and this should remain the goal.

## **ADDRESSING THE TERMS OF REFERENCE**

The Panel considered the Terms of Reference and determined the information needed to make an informed decision on each. The items of work required to obtain this information are summarised below; the Terms of Reference informed by each item are stated in each case.

## **1. Further analysis of the data collected for the Kimberley Chemical Use Review**

The Panel considered that the data reported in the Review could be further analysed.

The Panel has requested further analysis of possible differences in demographic, exposure and illness characteristics of the 90 participants in the Harper survey, according to their classification as:

- Having chronic disability probably attributable to their exposure (13 subjects)
- Having chronic disability possibly attributable to their exposure (14 subjects)
- Having no disability related to herbicide exposure (63 subjects)

*To inform Terms of Reference 1, 2, 5, 6*

### *Progress*

The Department of Health's Health Information Centre is doing this work.

## **2. Recent reviews on Multiple Chemical Sensitivity and the evidence for a biological basis for it**

The potential for the symptoms described to be consistent with the syndrome of Multiple Chemical Sensitivity was discussed with Dr Harper. Dr Harper did not exclude this possibility but did not refer to his findings as suggesting Multiple Chemical Sensitivity.

The Panel called for recent reviews on this topic and information on the biological basis for the syndrome to evaluate the likelihood that Multiple Chemical Sensitivity accounted for any of the reported symptoms.

*To inform Terms of Reference 1*

### *Progress*

Relevant papers are being provided to Panel members.

## **3. Literature review to determine the value of measuring levels of TCDD in fat 20 years after exposure**

Of the chemicals considered as possible causes of ill health to exposed APB workers, the dioxins (polychlorinated dibenzodioxins) have the greatest potential for harm to human health. The best known of the dioxins is 2,3,7,8-tetrachlorodibenzo-p-dioxin, commonly referred to as TCDD. The half-life of dioxins in human tissues is about 7 years, therefore up to a 16-fold reduction in tissue residues will have occurred since the first possible exposures in 1975.

Although the Panel felt that there was probably little value in analysing TCDD levels in fat now, as exposure occurred 18-28 years ago, its potential value should be explored.

*To inform Terms of Reference 1, 2, 4, 5*

#### *Progress*

Dr Robert Kenyon, a Panel member, has prepared a synopsis of the value of measuring TCDD levels in fat, and a review of the literature on the measurement of TCDD levels in fat is being undertaken by the WA Department of Health.

#### **4. Literature review to determine the association between exposure to 2,4-D, 2,4,5-T and dioxin and ill health, as defined by death, disease and symptoms**

The Panel accepted that the major source of information on the health of the APB workers would be the information contained in the Review. The Review documents 34 deaths among the 321 identified members of the cohort and the cause of death in 26. The Review also provides information on current and past symptoms of ill health among 90 of the surviving members of the cohort.

Comparison of the reported symptoms and causes of death in the APB workers can be made with the health effects associated with exposure to these chemicals reported in published studies. Should other studies report that symptoms similar to those reported by the APB workers have a significant association with exposure to these chemicals, the strength of the case for a causal association would be increased.

As much of the world literature on the potential health effects of exposure to 2,4-D, 2,4,5-T and dioxin uses death or disease as the end points of interest whereas symptoms are the major end point documented in the Review, and because research is ongoing and new associations are described not infrequently, a new review of the world literature is required.

Following the assessment of the world literature, a comparison can be made between published findings and the symptoms and other health effects reported by Dr Harper.

The need for further information, and possibly further investigation, will be decided once the literature review has been completed and studied by the Panel.

*To inform Terms of Reference 1, 2, 5, 6*

#### *Progress*

Academic groups with experience in environmental health have submitted proposals for a competitive contract. It is expected that the contract will be let in March and that the work will take about twelve weeks from commencement to completion.

**5. Formal dermatological survey of the 90 survey respondents to ascertain if there is a history or current evidence of occupational skin disease**

Following consideration of the literature review, the Panel may decide to ask former APB workers if they would be willing to take part in a dermatological survey to seek evidence of effects on their skin that could be attributable to their exposure to herbicides. Should such evidence be found, it would provide objective support for the contention that ill health had developed in association with exposure to the herbicides.

The Panel recommended consideration of a formal dermatological survey in which all respondents are interviewed and examined by a dermatologist (if possible, an occupational dermatologist). A detailed occupational history should also be taken to identify those plants sprayed by each worker, the specific herbicides used (generally, 2,4-D was used against Noogoora Burr, and 2,4,5-T against Parkinsonia), and the duration and amount of exposure to each.

*To inform Terms of Reference 1, 2, 4, 5, 6*

*Progress*

Awaiting a decision by the Panel to proceed, after consideration of the literature review.

**6. Review of current and proposed measures in Australia to assess and manage risks to human health posed by chemicals used in agriculture protection programs, and to monitor the occurrence of any adverse effects**

Recommendation 10 of the Review suggests a pro-active approach to managing the risks of chemicals used in agriculture protection programs. The Panel supports the principle of such an approach, but felt that the specific details should be determined in the light of a full review of present relevant programs and new ones that may be under consideration. It noted, for example, that the National Registration Authority for Agricultural Chemicals is currently looking at a national scheme for the notification of adverse reactions to agricultural chemicals.

*To inform Term of Reference 5*

*Progress*

The Western Australian Department of Agriculture has agreed to provide the Panel with a description of the current and planned risk management processes for Australia.

## **PLANNED COURSE OF ACTION**

The Panel is waiting the completion of the various projects detailed above. When these results are available, it will meet by teleconference to determine the actions then required.

The current projects may supply sufficient information for the Panel to determine its advice to government as required by the Terms of Reference. If this is not the case, then further work may be requested.

## **CONCURRENT WORK**

The Panel was strongly supportive of the concurrent work to provide support and care for former APB workers and to further investigate their individual health concerns.

- The Kimberley nurse support and liaison service was established at the Derby Aboriginal Health Service in December 2002, to provide a source of advice and medical advocacy for former APB workers. The service has been well received and well used to date, with 12 face-to-face consultations and many telephone contacts from its inception till the end of January 2003.
- Concurrently with the establishment of the nurse support service, a senior doctor from the Department of Health and a clinical toxicologist from Royal Perth Hospital travelled to the Kimberley to provide education and advice to Kimberley doctors.
- Further analysis of the deaths among former APB workers is being undertaken, to attempt to identify all deaths and to compare the mortality rate in the APB cohort with similar cohorts. This is being progressed by the Health Information Centre of the Department of Health.

## **APPENDIX ONE: TERMS OF REFERENCE**

1. To carry out a formal evaluation of the finding by Dr Andrew Harper in his Kimberley Chemical Use Review Report that illness did develop among former Agriculture Protection Board (APB) workers in the Kimberley in association with exposure to herbicide sprays they applied between 1975 and 1985.
2. To determine whether more detailed medical information is needed on particular persons who were interviewed in the course of the Review.
3. To consider whether any information on former APB workers in the Kimberley who were not interviewed in the course of the Review, or on members of their families, needs to be taken into account in producing the panel's report.
4. To recommend any action regarding and if necessary oversee the collection of such further medical information as required.
5. To provide advice on Recommendations 2-6 and 10 of the Review.
6. To provide advice as to whether the panel's findings on any association between contact with the herbicides 2,4-D and 2,4,5-T and ill health in former APB workers in the Kimberley are applicable to other workers in Western Australia.
7. An interim report is to be provided within three months of the panel meeting, and a final report to be provided as soon as possible.
8. The Terms of Reference may be modified from time to time by the Minister for Health in consultation with the Panel.

## **APPENDIX TWO: MEMBERSHIP OF THE EXPERT MEDICAL PANEL**

### **Professor Bruce Armstrong AM, FAA, BMedSc (Hons), MBBS (Hons), DPhil (Oxon), FRACP, FAFPHM**

Chair of the Panel

Head, School of Public Health and Medical Foundation Fellow,  
The University of Sydney

Professor Armstrong is an environmental epidemiologist of international repute, with a special interest in cancer control.

### **Dr Tim Driscoll PhD, MBBS, MOHS**

Dr Driscoll is an epidemiologist with special interest and experience in occupational health and safety. Dr Driscoll has worked for over 10 years with the National Occupational and Safety Commission, and is currently in private practice.

### **Dr Geoffrey Duggin FRACP, FAFPHM, MBBS**

Head, Toxicology Unit, Royal Prince Alfred Hospital and Royal Alexandra Hospital for Children; Senior Staff Specialist, Royal Prince Alfred Hospital (RPAH).

Dr Duggin is responsible for the Poisons Information Service at RPAH which provides national advice on poisoning events and for the care of patients with poisoning from across NSW.

### **Dr Peter Greenberg MD, PhD, FRACP**

Dr Greenberg is a senior consultant at the Royal Melbourne Hospital and a Principal Fellow in the University of Melbourne Department of Medicine.

### **Dr Robert Kenyon BSc, PhD, MBBS, FAFOM**

Dr Kenyon is a senior occupational physician with the Occupational Medicine Unit in Workcover, NSW. Since 1989 he has been a member of the NHMRC Drugs and Poisons Scheduling Committee and a member of the ICOH scientific committee on pesticides.