

**Study of Health Outcomes in  
Aircraft Maintenance Personnel  
(SHOAMP)**

**Phase I**

**Qualitative Interviews**

**Final Report  
July 2003**

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## **SYNOPSIS**

This manuscript reports the final findings from Phase I Qualitative Interviews of the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP). The Study was commissioned by the Department of Defence in response to concerns regarding adverse health outcomes associated with involvement in the F-111 Deseal/Reseal (DSRS) processes, conducted as part of fuel tank maintenance of these aircraft.

The aim of the Qualitative Interview Study was to explore the F-111 DSRS programs and activities from the perspective of involved personnel. This involved in-depth face to face interviews with sixteen individuals who participated in the DSRS programs and/or related activities. Their experiences were used to help frame DSRS program activities within a broader social context and for the exploration of a number of issues of direct concern and relevance to the wider epidemiological SHOAMP project.

Six key topic areas were identified for investigation;

- Membership and participation in the program;
- Demarcation of roles therein;
- The reported health problems and symptoms of those involved;
- Protective clothing and equipment employed on the programs;
- The physical environment and spatial cartography of different program activities; and
- The work history of personnel.

In addition, a small summary section is included which centres on features of the broader cultural context obtained at Amberley RAAF Base during the programs. This is relevant for the wider SHOAMP, in terms of how this context may have structured the workplace practices of interest (ie, those leading to exposures).

Analysis of personal interview transcripts identified a number of important findings, which would help to inform the wider research project. Findings from the interview data confirmed aspects of the earlier documentation regarding the F-111 DSRS programs, and also provided valuable data on other aspects not included in previous investigations.

One particularly important area of qualitative data analysis presented here relates to issues of exposure. The interviews assisted in identifying personnel potentially at risk of exposure. This in turn helped to inform the wider research study, in terms of more accurately defining exposed and comparison cohorts for the Mortality and Cancer Incidence Study and the General Health and Medical Study.

Based on the six key areas of enquiry, the main findings are summarised below together with recommendations for the General Health and Medical Study.

#### Membership and participation in programs

- Confirmation of the types of personnel (muster categories, Base posting locations etc) who were directly involved in F-111 maintenance programs. These data will be retained as a guide to identifying further exposed personnel.
- Additional groups (not specified elsewhere) were also identified who were potentially at risk of exposure from RAAF work activities. These consist of two groups of workers not directly involved in the F-111 DSRS programs. The first group involved any RAAF workers sited in close physical proximity to the areas where F-111 program work was being carried out. The second additional at risk group were RAAF workers not sited near to F-111 program work, but whose duties involved disposal of wastes and maintenance of Base equipment/facilities, or 'ad hoc' involvement in program tasks.

#### Recommendations –

- Retain current definitions of “exposed” personnel. Further work be carried out to clarify the status of potentially exposed personnel who carried out activities in close proximity to the F-111 DSRS programs.

- Clear identification must be possible for those workers categorised as F-111 DSRS and those who worked in close proximity. Comparison cohort individuals may need further screening to identify those who have carried out F-111 DSRS related activities, which may impact on final analyses.

#### Demarcation of roles

- Interviews confirmed existing documentation that suggested a wide number of RAAF workers were rotated across tasks associated with F-111 DSRS programs. This includes supervisors, although to a lesser degree than other categories of worker, in terms of time spent on tasks. The exception to this routine rotation of tasks was that workers of smaller stature were reported to be disproportionately involved in work in the smaller fuel tanks, which also confirms prior documentation.
- Additional task rotation was identified for tasks within F-111 maintenance programs (extending beyond those tasks directly associated with fuel tank repairs), that have been the focus of documentation collected previously. These include mixing, storage and disposal of solvents, sealants, and wastes as well as maintenance of chemical storage areas and of F-111 work areas.

#### Recommendations –

- While mustering types can be used to identify ‘most at risk categories’, the specific tasks undertaken by personnel in terms of fuel tank work and other associated tasks, should not be assumed on the basis of muster categories or rank. The broader research team should be aware of this fact when designing instruments for the study, and when working with data to determining dose exposure constructs.
- In light of the potential for task rotation, the General Health and Medical Study documentation should provide scope for individuals to indicate what their particular duties may have been.

## Reported health problems and symptoms

- Health problems and symptoms raised during the qualitative interviews were in agreement with the range of complaints previously identified. This information should be retained.
- Links between types of exposures and reported health problems/symptoms appear to be variable and should not be assumed. In the case of headaches and migraines, for example, tasks requiring the use of MEK and MIL-SPEC are linked by participants with both their short and long term experience of these problems. Conversely, in the case of rashes and skin problems, tasks requiring the use of MEK and MIL-SPEC are sometimes linked by participants only with their short-term experience of these problems. This example is chosen to demonstrate the importance of gathering data on both short term (experienced at the time) symptoms, and long term symptoms (developing up to the present time), and of considering the health implications of both types of symptoms as well as any relationships between the two over time.
- The validity of self-report by workers was identified as an issue for consideration within the wider study. Denial of health problems by workers, with subsequent disclosure of same, occurred after spousal revelations and prompts during interviews. This was particularly so in the case of psychosocial impairments and complaints of a more personal nature.

## Recommendations –

- Where possible, the General Health and Medical Study design should take account of both short and long term symptoms.
- Assessing the validity of self-report of health problems is always problematic, particularly when researching men's health. Some method of verification of health claims should be incorporated into the next phase of the study, and care taken to encourage full disclosure of health problems. Information provided by spouses, where possible, may provide a mechanism for such checks.

### The work history of personnel

- Little data are available on the pre- and post-program involvement work history of personnel involved in the F-111 maintenance programs. Some of the work histories discussed during the qualitative interviews highlighted the potential for confounding (non-program-related) exposures to chemical hazards. Two groups of workers were identified as being likely to have experienced potentially confounding exposure to non-program chemical risks: workers whose RAAF and/or private sector work roles were likely to have involved high levels of chemical exposures over time, and those workers who had spent considerable time on non-F-111 aircraft routine maintenance, again both within the RAAF or in the private sector.

### Recommendations –

- Information on potential confounding work practices should be collected during the General Health and Medical Study. This should occur for both the exposed and comparison cohorts. A short work history designed to identify workers with a high risk of chemical exposures in previous/current work roles could be incorporated into either the health examination or questionnaire aspects of the Study.

### The use of personal protective equipment by personnel

- The qualitative interviews provided confirmation of information previously documented, regarding the progressive increase in the use of personal protective equipment (PPE) over successive F-111 DSRS programs. Discussions included a greater focus being placed on PPE by RAAF management over time, greater perception of risk on the part of workers, and increased flow of information relating to the chemicals in use within the organisation.
- Beyond this general trend, some variation in use of PPE by individuals was identified, both across programs and within them.

Recommendations –

- The use of PPE is one area for further consideration within the General Health and Medical Study. Use of PPE by individuals should not be assumed to be uniform in all situations, or at all times.

Base culture and the broader cultural context of work

- The Base culture, which existed at Amberley (which may have changed over time), clearly influenced attitudes to risk and to work safety at all levels. In particular complaint, questioning of tasks, or how these were carried out was strongly discouraged within this culture and was perceived most often as an attempt at ‘shirking’ work.
- Additionally, these attitudes were found to persist in workers no longer associated with the RAAF, manifested in a reluctance to characterise exposures and failings in PPE as risky. In some cases a strong sense of institutional loyalty to the RAAF had the same effect.

Recommendations –

- During the General Health and Medical Study, data gathering on exposures and risks should be carried out using instruments that are as non-threatening as possible. Care should be taken to reassure workers that any information they may provide will not be used to lay ‘blame’ and will only be used in their own best interests to try to quantify the study results fairly and accurately.

## **ACKNOWLEDGMENTS**

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Other members of the SHOAMP research team have also provided valuable assistance and support to the qualitative phase of the project and we extend our gratitude to all those involved. Also many thanks to staff from the Department of Veterans' Affairs, in particular members of the nominal role team who helped at the sampling and recruitment stages.

Finally, our warmest thanks go to all those personnel who kindly gave up their time to be interviewed and who generously shared, what were for all interviewees, deeply personal and moving experiences regarding their time and input on the various F-111 Deseal/Reseal programs. Without access to their rich accounts the qualitative phase and this report would not have been possible. Thank you.

## **BACKGROUND**

Ordered from the United States in the early 1960s, the F-111 aircraft are an important part of Australia's defence. The advantage of these aircraft is that they can fly long distances at high speed. This requires the ability to carry a large quantity of fuel and the fuel tanks to be sealed in such a way as to avoid leakage under such extreme conditions. The F-111s have numerous fuel tanks of varying size. At the time of manufacture sealant was put between the overlapping metal surfaces in the tanks. Over time the sealant used deteriorated and needed to be replaced. This involved initially removing the original sealant inside the fuel tanks (desealing) and replacing with new sealant (resealing). Removal of the sealant required firstly the use of chemicals, then physical removal using water jets and then manual removal using hand tools. For the fuselage fuel tanks the process of desealing and resealing required physical access to the tanks while for wing tanks actual entry was not required.

There were four F-111 Deseal/Reseal programs conducted over the period 1977 to 1999, involving RAAF personnel and some contracted civilian workers. In addition, routine maintenance activities were carried out in between programs as necessary. Methods used during each program varied over time. Some concerns have been reported regarding adverse health effects as a direct result of participation in the F-111 DSRS programs. These concerns have included neurological and psychological problems and possible increased rates of cancer and multiple sclerosis. In response to this, a Board of Inquiry (BOI) was conducted into the chemical exposure of F-111 DSRS workers to clarify exactly what happened. The BOI concluded that there was evidence that neither respiratory protection nor skin protection requirements were complied with. Moreover, there may be a multiplication effect on health when DSRS practices were combined with confined working space and high temperatures. It was recommended that an epidemiological study be conducted into the symptoms described by personnel involved in the F-111 DSRS programs compared with

appropriate comparison personnel, and this was endorsed by the (then) Chief of the Air Force following release of the BOI conclusions.

The task faced by the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP) is to determine if there is evidence to support anecdotal reports of adverse health problems in personnel involved in the F-111 DSRS programs. There are three Phases to the study. Phase I of SHOAMP involved a detailed literature review to obtain the most recent information on the relationship between exposures potentially encountered during DSRS activities and possible outcomes; finalisation of the definition of exposed and comparison cohorts, development of a detailed Protocol Manual to conduct a General Health and Medical Study, and a Qualitative Study to help inform the definition of groups and measures required for the General Health and Medical Study examinations to be undertaken as Phase III of the Study of Health Outcomes in Aircraft Maintenance Personnel. Phase II represented a Mortality and Cancer Incidence Study, the results of which are reported elsewhere.

# INTRODUCTION

This final report outlines the methods and results of the qualitative interviews undertaken as part of Phase I of the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP). It provides information additional to an Interim Report, submitted July 11, 2002. The qualitative interviews were conducted to accomplish two prime objectives:

- (1) To confirm the accuracy of earlier documentation exploring the activities undertaken as part of the F-111 Deseal/Reseal programs; and
- (2) To identify and investigate other important aspects of the programs and activities not previously covered by earlier investigations.

The results and analyses presented are structured with these objectives in mind and grouped according to six main areas of investigation: membership and participation in the program, the demarcation of roles therein, the reported health problems and symptoms of those involved, protective clothing and equipment employed on the programs, the physical environment and spatial cartography of different program activities, and the work history of personnel. In addition a section on Base culture is also included. Supporting material is presented in table form, in order that the breadth of material available from all participants could be indicated at a glance, and by the use of direct quotations from the interview transcripts. It is intended that this quoted material will both lend supportive weight to the results presented, and will also give the larger study team an insight into the day to day experiences of F-111 workers and their experiences on the various programs.<sup>1</sup>

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<sup>1</sup> All qualitative data presented in this Report is verbatim (as expressed by each informant).

## **METHODS AND FIELDWORK DETAILS**

### **Identifying and Selecting Interviewees**

Some data were already held by the Department of Veterans' Affairs, obtained as part of the Board of Inquiry (BOI), identifying workers involved in the Deseal/Reseal program work during the period from 1975 to 2000. These data included both witness statements and interviews with participants. Building upon this information, a larger database was assembled to include details of Defence personnel and contracted civilian workers who were not nominated as part of the BOI but were still involved in F-111 Deseal/Reseal activities (ie; in charge of duties conducted outside of the fuel tank, supervising other workers, or mixing or assisting with disposal of chemicals). The database, at the commencement of the qualitative study, held names of more than 1200 individuals who were either identified through the BOI, had called up about their involvement or had been nominated by others who knew them.

It was considered important to ensure that the qualitative study included individuals from the range of different DSRS programs and activities. Initially a series of four interviews were conducted on individuals identified by the Department of Defence and the Department of Veterans' Affairs as key informants. These included individuals who had been actively involved in the DSRS programs or activities and/or had an in-depth knowledge of the circumstances surrounding the health concerns and preliminary investigations of the DSRS programs and activities. For selection of the remaining Qualitative Study sample, the entire DVA 'exposed' database was classified according to activity/program type (ie: Program 1, Program 2, Wing Program, Spray Seal Program and Miscellaneous) and a proportional selection of potential interviewees randomly obtained from each group. Potential participants were then sent an invitation by the Department of Veterans' Affairs, on behalf of the Study Investigators. The invitation letter requested that participants complete a

signed consent form and return to SHOAMP Investigators if they were interested in taking part in the Qualitative Study.

There were originally twenty-two individuals identified for invitation. While remaining mindful of their potential key informant status, this figure was later reduced to eighteen due to the isolated and distant location of four of the original twenty-two individuals. Invitations were mailed out to the eighteen randomly selected individuals on Friday 3 May 2002 and a reminder card sent exactly seven days following. A copy of the information and consent package, and the reminder, mailed to potential participants can be found in Appendix A.

## **Conducting interviews**

Data collection fieldwork was conducted from May to June 2002 by two trained Health Social Scientists – one male, one female. The fact that both genders were represented within the interviewing team may have helped to strengthen the exploration of core sensitive themes in the interview process. Some informants seem to have felt more comfortable and were more forthcoming to either a male or female interviewer. However, neither interviewer felt that data collection was seriously restricted or compromised due to such considerations.

The location of the interview was agreed prior to meeting and was selected by the informant. The interviews were conducted in the private home of the interviewee, at the airbase itself or by phone (one). The interviews ranged from forty-five minutes to two hours in duration with the majority taking approximately 1-1.5 hours to complete.

On meeting the informants at the agreed interview venue, participants were provided with documentation detailing the aim and brief synopsis of the qualitative interviews and wider SHOAMP. Consent was once again reaffirmed and other ethical issues outlined for the informant. All interviews proceeded with agreements of confidentiality and anonymity assured to the interviewee.

Prior to fieldwork, and concurrent throughout the data collection phase, a theme list was developed by the interview research team in consultation with other SHOAMP researchers (see Appendix B). Themes were developed in accordance with data and findings already available from the BOI and, more importantly, in line with areas of particular concern and interest to the SHOAMP research team more generally. While the BOI provided an exhaustive and comprehensive investigation within a designated range of interest the research team also required answers to questions beyond the scope of the BOI.

In addition, and in line with the fact that qualitative research is essentially *inductive* in that it seeks to build theory from data, themes (and thereby questions) were revised and new themes (questioning) introduced in accordance with data and focus introduced by the interviewees themselves.

For example, it soon became clear early in the interview fieldwork that the original theme list (Appendix B) was not sensitive enough to effectively question both maintenance workers and also those who occupied a supervising role in the F-111 Deseal/Reseal programs. In response, two slightly revised theme lists (Appendices C and D) were developed to help engage individuals from the two different groups (with different orientations toward and experiences of the programs) by approaching topics and wording questions in a more sensitive form more easily understandable to each respective group. Refer to Appendix E for the rationale for change. Appendix F outlines the brief work history sheet completed for each interviewee.

All interviews were tape-recorded with consent of the informant involved.

Interviewers also took written notes throughout the interviews to supplement tape-recorded data. These were later consulted and integrated into data analysis along with the tape recordings. Prior to attending the interview, interviewers were provided with a General Information and Risk Management Manual, which contained details regarding the selection and consent process for interviewees, copies of the invitation documentation, the roles and rights of participants in the qualitative study, ethical and legal considerations and occupational health and safety issues. Refer to Appendix G.

## **Coding and Analysis**

All tape recordings were first transcribed to Word files (Windows 98) as soon after the interview as possible and then entered into the qualitative analysis computer package N-Vivo where they were analysed and sorted into code files. Codes were then organised and regrouped in terms of broad themes by the three researchers involved. These themes provided the framework for the following results/analysis section. Researcher triangulation (individual researchers coding and interpreting data separately and then meeting to discuss, rework and refine analysis) was employed to help improve the internal validity of the analysis produced.

Approval to conduct the Qualitative Study was given by The University of Newcastle Human Research Ethics Committee, The Department of Veterans' Affairs Human Research Ethics Committee and the Australian Defence Human Research Ethics Committee.

## RESULTS AND ANALYSES

Written consent was received from thirteen of the 18 individuals who were approached; two did not respond and three were returned to sender without being completed. Twelve face-to-face interviews were conducted, with one person unable to be contacted to schedule a definite appointment time. Together with the four pilot interviews this provided sixteen interviews for analysis. The sample included 14 males and 2 females.

### Membership and Participation in Programs

The qualitative interviews confirmed much of the detail of the earlier investigations and documentation regarding who was involved directly in the F-111 Deseal/Reseal programs. However, with the scope of interview focus including detailed exploration of such procedures as *disposal* and *storage* of chemicals used in the programs, analysis also identified a number of additional groups perceived by informants to be at potential risk of chemical exposure. These are outlined in Table 1 and Table 2.

There are some categories of workers who, although not directly involved in the programs, may have been at risk of chemical exposure. These groups were largely composed of workers sited in close proximity to areas where program activity was being carried out (the administrative workers inside the hangar where the spray seal program was conducted, those working in the paint shop during the period of operation of the rag hangars), and workers who may have been exposed to risk through their work in other sections of the Base (firemen involved in disposal of spent F-111 program chemicals, workers brought in on an ad hoc basis for certain tasks or at certain times, Base groundsmen and plumbers). These individuals are outlined in Table 3.

**Table 1 : Groups Identified by Interviewees and Perceived Exposure Levels**

TRADE	PROGRAM	TASKS	EXPOSURES	CONFIRMED	LOCATION
<b>Firemen</b>	1971 – 1979 (P1).	Disposed/ burnt chemicals and fuel waste in pits as training. Collected and transported drums of waste from all over the Base and external waste.	Splash back. Inhalation. Smoke and chemical fumes (fire would produce heavy black smoke).	BOI.	Chemical Separator. Dam. Rag Hangar.
<b>Auxiliary firemen from all over the Base</b>	1971 – 1979 (P1).	Burnt waste as part of training.			Working nearby.
<b>Supervisors</b>	All Programs.	Demonstrated how to use equipment, work inside tanks. Chemical disposal and mixing. Inspections.	Skin. Inhalation. Splashes, chemical smells, spills.	BOI.	Inside tanks at Rag Hangar. Chemical dam.
<b>Personnel in the engine test shed<sup>2</sup></b>	P2.	Unknown.			Next to furnace.
<b>Air Defence Guards</b>	P1.	Guard the Base, did training at Worrell Creek.			Worrell Creek.
<b>Aircraft Metal workers</b>	P1.	Maintenance jobs.			Working nearby.

<sup>2</sup> Wording and categorisation as employed by interviewees

TRADE	PROGRAM	TASKS	EXPOSURES	CONFIRMED	LOCATION
People working in Flight Line	P1.	Unknown.			Working nearby.
NDI (Non Destructive Inspection) Technicians	All Programs.	Unknown.			Working nearby and in Rag Hangar.
Engine Fitters	P2.	Pulling down Rag Hangar.	Inhalation. Skin.	BOI.	Rag Hangar.
Airframe Fitters	All Programs.	Pulling down Rag Hangar. DSRS duties inside tanks. Mixed chemicals. Disposed of chemical waste.	Inhalation. Skin. Splashes and spills. Chemical smells. Clothes.	BOI.	Tanks inside Rag Hangar. Chemical Separator dam.
Avionics Technicians (Gunnies)		DSRS at some stage, helped out with cleaning. Used some sealant.	Inhalation. Skin. Splashes. Chemical smells, spills.		Tanks inside Rag Hangar.
Motor Transport Fitters	P2.	Sometimes did cleaning duties.	Inhalation. Chemical smell, spills, clothes.		Rag Hangar.
Structural fitters	P2.	Preparing or cutting away bits.	Inhalation. Skin.	New – noted in interviews.	Rag Hangar. Working nearby.
Administration huts, with also a lunch room and toilet facilities	P2.	Working nearby.	Inhalation. Chemical smell. (Rag Hangar doors kept open for ventilation).	New – noted in interviews.	Working in huts behind rag hangar (wall separating Rag Hangar and 2 rows of 4 Huts). 'Sealant in the middle of those'.

**Table 2 : Ancillary Groups Identified by Interviewees and Perceived Exposure Levels**

ANCILLARY	PROGRAM	TASKS	EXPOSURES	CONFIRMED	LOCATION
<b>Weekend Reservists (could have been firemen, RAAF personnel, Army reserves) were bought in approximately once a month if needed on weekends From Squadron 23 the 'PNG' guys</b>	1971 – 1979 (P1).	Worked in pits. Collecting and dumping waste chemical.	Inhalation. Clothes. Skin. Chemical smell.		Chemical separator dam. Pits.
<b>Carpenters</b>	(P1).	Working nearby.	Unknown.	BOI.	Nearby.
<b>Plumbers</b>	All Programs.	Drain leaks, drum leaks, cracks and overflows. General plumbing.	Inhalation. Skin. Spills. Splashes. Chemical smells. Clothes.	BOI – Airframe Fitters did some plumbing work.	Rag Hangar. Chemical dam. Chemicals would corrode drums and were then turned upside down. Drains would crack, leak and overflow into Worrell Creek, which runs into Braemar River and runs into Brisbane River.
<b>Lawn mowing people</b>	All Programs.	Mowing. Working nearby.	Inhalation.	BOI.	Mowing around chemical dam.
<b>Painters</b>	All programs.	Painting. Sometimes had to re-paint as paint would peel off due to chemicals.	Inhalation. Skin.	BOI.	Tanks, Rag Hangar. Stored chemicals in drums near to where painters were (in P2).

ANCILLARY	PROGRAM	TASKS	EXPOSURES	CONFIRMED	LOCATION
<b>Truck Drivers</b>	All Programs.	De-constructing Rag hangar. Loading.	Skin. Inhalation. Clothes.		Rag Hangar.
<b>Motor Body Builders</b>	P2.	De-constructing Rag hangar.	Skin (hands). Inhalation.		Rag Hangar.
<b>Electricians</b>	WP.	Worked nearby whilst DSRS was being carried out.	Inhalation. Chemical smell.		Nearby.
<b>At home (Family)</b>	P2.	Clothes (t-shirt/ shorts) washed at home. Bed mattresses had to be discarded due to chemical smell.	Unknown.	New – noted in interviews.	In the home.

**Table 3 : Interviewees' Reported Symptoms, Tasks, Exposures and Diagnoses**

	<b>Long Term Symptoms</b>	<b>Short Term Symptoms</b>	<b>Tasks</b>	<b>Exposures</b>	<b>Diagnosed</b>	<b>Treated</b>	<b>Confirm</b>	<b>New</b>
<b>Supervisor 1 (P1)</b>	Low testosterone count. Short term memory loss. Congested sinuses and coughing. Hernia – enlarged.	Skin Rashes. Smell permeated body.	Supervisor. Demonstrated equipment use and being inside tanks. Managed troops. Inspections on tanks (had to be inside tanks). Disposal. Mix chemicals.	Skin. Inhalation. Chemical smells, spills.	Went to the Doctor about sinuses and respiratory/ coughing. Hernia has become enlarged (was smaller).		All.	N/A
<b>Supervisor 2 (P1)</b>	Kidney Stones. Bowel problems. Skin Rashes and heat rashes. Suggested concerns having more children due to ill effects that may be caused by contact with chemicals in program.	Nausea. Smell permeated body, clothes, hair which gradually wore off.	Supervisor of all troops. Demonstrated how to do jobs. Worked in tanks. Cleaned out hangar.	Skin. Inhalation. Chemical smell. Splashes from blocked chemical sprinklers in tanks. Handling drums. Chemical spills on the ground. Rashes from working in confined spaces.	Doctor diagnosed kidney stones and bowel problem. Had rashes checked	Kidney stones removed surgically. Doctor treating bowel problem		

	<b>Long Term Symptoms</b>	<b>Short Term Symptoms</b>	<b>Tasks</b>	<b>Exposures</b>	<b>Diagnosed</b>	<b>Treated</b>	<b>Confirm</b>	<b>New</b>
<b>Supervisor 3 (P2)</b>	Headaches. Mood swings. Shortness of breath. Short term memory loss. Kidney Stone. Bowel problem. Ongoing Urinary problems.	Headaches.	DSRS Aircraft maintenance. Monitoring sealants in cockpit area. Remove sealant Cleaning. Fix tank leaks. Mix chemicals.	Inhalation. Chemical splashes.	Annual assessment by boss and counselling (for mood swings). Had a colostomy and found polyps.	Tries to keep fit and keep weight down.		
<b>Fireman</b>	Intestinal problems. Irritable Bowel Syndrome (IBS). Loss of sense of Smell. Mood swings.	Full body rash.	Fire drills. Chemical and fuel waste disposal. Burning/ transporting waste.	Chemical splashes. Skin (hands). Spills. Inhalation. Chemical smell.	Has seen Doctor about intestinal problems, IBS.			
<b>Airframe Fitter 1(P1)</b>	Cyclical and recurring peeling flaking and scaled skin (hands, knees, feet, scalp). Short term memory loss. Loss of sense of smell.	Peeling and flaking skin (hands and feet).	DSRS tanks Disposal and storing of chemical SR51. Cleaning off old sealant in tanks. Tail fin work. Water blasting of sealant. Rib blasting of sealant. Worked at chemical dam.	Skin. Inhalation (fumes). Splashes. Spills. Chemical smells.	Sent for Psychological Testing and CT Scans for memory loss. Says skin condition is getting worse (self diagnosis).			

	Long Term Symptoms	Short Term Symptoms	Tasks	Exposures	Diagnosed	Treated	Confirm	New
<b>Airframe Fitter 2 (P1)</b>	Headaches induced by chemical odours. Neck pains. Dizzy spells. Sore eyes. Skin problems.	Headaches. Flaking scaly, blistering skin (hands). Smell permeated body, hair, clothes.	Worked directly in tanks on DSRS. Mixing chemicals. Cleaning tanks.	Chemical splashes in eyes. Inhalation. Skin (hands). Spills. Chemical Smells.	Doctors did tests on eyes and for headaches. Never said anything about dizzy spells – self diagnosis.	Doctor prescribed medication (says didn't help much).		
<b>Civilian Contractor 1 (HDH) (P2)</b>	Oesophagitis 2 <sup>nd</sup> grade (Reflux). Under-active Thyroid. Fatigue. Lack of motivation.		Working in the hangar. General maintenance DSRS in tanks. Mix chemicals.	Inhalation Splashes Spills Skin Chemical in Hair	Specialist diagnosis for thyroid. Blood tests for fatigue/ thyroid. Specialist for reflux. Gastroscopy.	Specialist treatment for thyroid. Taking Thyroxine every day for the rest of life. Medication for reflux.		
<b>Civilian Contractor 2 (AWA) (WP)</b>	Impaired liver function. Impaired kidney function (non cancerous cysts present). Asthma type symptoms. Bowel problems. Hernia. Chronic fatigue syndrome. Headaches from by chemical odours. Depression. Hot flushes. Arthritis.	Fatigue.	Hand picking. Deseal.	Inhalation. Skin. Splashes. Chemical smells. Spills.	Consulted a Doctor about Liver /Kidney problems, and about Asthma/ respiratory complaints. Had x-rays for kidney problems. Went to a Urologist. Blood tests for Liver function Pathology for CFS.	Uses Puffers for asthma/ respiratory problems. Hospitalised twice for Kidney problems. Prescribed pain medication by Doctor.		

To give an example of the experiences of workers not involved in the program but working in close proximity to the program, we quote from an interview with a former program worker who remained on the Base:

*Later on, after I was out of deseal, I was working in the rotary which is near that section, I did know that they actually moved the drums at one point to a different area with the SR51 in it. I remember at times when the wind would blow the right way they closed down the painters' section because it was closest to the drums because they would all start to get headaches. They closed it down and sent them all home for the day until they could find out which drums were leaking or removed them or fixed them up. I thought that was quite ironic because the years that we worked there they never worried about us going out there and using the stuff but obviously as it went on a little bit maybe they had become a little more aware about having the drums closer to people in that situation.*

An interview with a supervisor engaged in largely administrative task during the Hawker De Havilland program indicates that, much later on and for different reasons by this time, proximity was still an issue ("R" represents respondent, "I" represents interviewer):

*R - Yeah so I mean the office was right near the um, the sealant lab and also um at one stage my office was in the hangar, well right next to the hangar as well.*

*I - Oh yeah okay. Just to confirm that, which program was that on when you actually had the office, um was that the one where it was basically part of the hangar was sectioned off and there was offices in one side?*

*R - Yep.*

*I - Yep okay. Well which hangar was that?*

*R - Um 278 I think.*

Despite this interviewee's actual work on the F-111 maintenance program being limited to inspection of completed work and management duties for the program, there was concern about their exposure and also reporting of one of the most commonly noted symptoms of chemical exposure, headaches:

*I suppose there's always some concerns, I mean I had mine as well...because I know I was getting headaches while I was in there... I hadn't had a problem with headaches before. And that was one*

*reason my office got moved from out of the hangar...because it was affecting me directly. And yeah there were always concerns about um I suppose the possible health affects, and we kept being reassured that you know everything was fine and within acceptable limits.*

The headaches experienced by this worker at the time have since ceased (at the time of interview), but the hay-fever like symptoms (which have also been reported by workers with direct tank experience) experienced while involved in two successive F-111 programs in supervisory and engineering capacities only, persisted at the time of interview:

*They referred me to a specialist in Brisbane and did some tests, and yeah I had allergy tests done through the RAAF medical system but by a civilian specialist...the only thing that came up there, you know he took about 50 samples, or 50 different types of things there, and the only one that come up positive was the test sample that there was no antihistamines in my system...they kept saying "oh you know you're allergic to something" but it, I'd been at Amberley for 3 years by that stage and never had any problems, until I went to deseal. And there's no history of hay fever or any allergy type problems like hay fever in my family.*

This worker also reports the high sensitivity to chemical odours in the form of perfume or ordinary household cleaning products commonly reported by tank and hangar workers from the various programs, further suggesting that the symptoms experienced by workers sited in close proximity to the F-111 programs indicate they may have been at risk of exposure, particularly via low level exposures over long periods of time, as in this case:

*Cleaning stuff yep...yeah you know even some of the things you know like Preen or some of those, the aerosol stuff like that, I say to my (spouse) "you can't spray that because it gets up my nose" and um, brings on my sneezing and that...like it was triggered a bit by you know some cleaning chemicals and things like that but the most annoying thing is actually changes in temperature and humidity...that's, yeah that's, that's what seems to um trigger it the worst. Um to the point where some days I haven't been able to work because I take some antihistamines and they just can't settle it and by the time I've taken a couple of those I can't do anything except sleep. Yeah and also my nose is still running constantly, so I basically can't sit up I've just got to go to bed and sleep for the day, which means I can't work for the day either.*

An example of the range of the other category of exposure possibilities, that is, workers exposed to risk through their work on the Base but *outside* of direct involvement in the programs, includes this quote from an armourer engaged in infrequently 'helping out the framies' during the 1<sup>st</sup> and 2<sup>nd</sup> DSRS programs:

*I wasn't actually involved in the full, full time deseal reseal working in the rag hangar ah because my background trade is an armourer, and um so effectively my exposure to the...the sealants that they were using and the associated chemicals and that, it was more or less on ad hoc basis um as part, part and parcel of my job...replacing the panels on the aircraft, anything associated with the armoured(?) system which involved sealing, um like getting the major panel line components on the crew(?) modules...Plus we used to help with framies on the odd occasions doing reseals and leak repairs on the fuel tanks and the main fuel tanks, the external fuel tanks.*

The implications of this sort of 'ad hoc' program involvement for worker health are considerable. Although minimal personal protective equipment (PPE) was in place during this period for identified program workers, awareness of possible risks and appropriate PPE was perhaps even lower amongst these peripheral workers. The following supporting quote is taken from later in the interview cited above:

*And the standard process for us, um we'd go out, you'd um have to use a knife and cut away the old sealant...you'd be putting your hands on it, knees on it, whatever and 9 times out of 10 you were working in shorts and t-shirts, flight line gear standard.*

Sometime the risks of exposure for this category of workers could be exacerbated by the nature of their specialised work in conjunction with the lack of any PPE. The following excerpt is taken from a discussion of the procedure for disposing of waste DSRS chemicals from the 1<sup>st</sup> program, as a part of normal fire-mans duties:

*R - Um, in regard to picking up, picking up the um various waste fluids we never really had any protective clothing...we had an old pair of gloves which were more of a nuisance than anything else in the glovebox of the vehicle. Um other than that we just wore our um blue, blue ah overalls, and boots you know...what we used to do is ah drop the 44 on the ground...either vertically or on it's side...um we had old spanner we used to undo the 2 um, the 2 valves on the tops of the 44's and just kick it over with our feet and it'd just flow into the um, into the pits.*

*I - Was there ever any splashback or anything that you saw?*

*R - Oh yeah, you used to get, Yeah. As a matter of fact I can remember using some of the kero, which was about to clean, to clean off the stuff, the gunk that used to get on our hands you know...um you'd often get um a tank that had expanded during the, you know with the heat and all that...and when you'd pop the top it'd, it would splash out and all that sort of stuff.*

Apart from this kind of direct exposure, similar to that encountered by recognised program workers, separate risks existed for this group. The chemicals dumped into pits in the manner described above were eventually burnt, once a 'holus bolus' of chemicals and substances dumped from all over the Base had accumulated in them. That chemicals were heated, and then inhaled by these workers during this disposal procedure is clear from the following account:

*I - Well with that too, the um, if you didn't know at the time that it was toxic did you have a good idea of what was in there, like in terms of the chemicals and stuff like,*

*R - No. No idea....We knew it was toxic because we'd walked through the stuff you know and you could breath it in and, You know you knew it was pretty bad, you couldn't wait to get out, put the fire out you know and get back...but that was in a part of the process, you had to um get used to it.*

This participant had made it clear that he never wore any form of PPE during this part of his disposal duties, as it was neither provided nor encouraged.

On occasion the poor visibility at night, a result of a combination of poor lighting and smoke generating by burning of chemical waste, had meant that he and co-workers had walked into the pits used for disposal whilst these were alight. This is an extreme example, but chosen to emphasise the importance of looking beyond direct membership in programs when assessing exposures to F-111 program chemicals. Given that the comparison group for the larger study is to be drawn from contemporaries also involved in RAAF work at Amberley Base, we suggest that some groups should be excluded from this comparison group on the basis of possible exposures to the substances of interest.

## Demarcation of Roles

Interview data analysed supports earlier findings of the Board of Inquiry (BOI) relating to the demarcation of roles within the Deseal/Reseal programs. Generally, all workers and sergeant supervisors on site confirm that both workers and supervisors were commonly rotated across all duties and tasks (regardless of trade background or muster category) and carried out all tasks regarding the actual fuel tank work. The reasons given for such rotation across tasks does vary depending upon whether a supervisor or a worker is commenting, and which program is being commented on. Supervisors claim this practice procedure helped to speed up work, as workers were interchangeable on different shifts:

*You know when you consider the size of some sections, um you had to be multi-skilled, you had to be able to ah work competently as on all you know aspects of the aircraft*

Other reasons for a lack of clear demarcation of roles included the claim that an attempt was being made to limit the time spent in tanks by individual workers, or that who did what just depended on the stage of work and not specific musters:

*Everybody was in the deseal program who worked on the aeroplane....was interchangeable throughout the aeroplane....on one aeroplane they may be allotted to one section of a particular team....on the next aircraft you may be allotted to another....separate location, because you didn't want everybody inside the tanks you know for as long as, long as possible.*

It was also suggested that supervisors did some tank work as part of training their staff, which is congruent with the 'on the job' nature of the training provided on programs as detailed in the BOI, or that they 'pitched in' at particularly busy times:

*Just totally supervision but you have to do some of the work yourself....it's not a case of ah do as I do it's, not a case of do as I do but do as, do as I say it's do as I do...in other words you get in and do some of the jobs as well...so that you could show them how to do some of the jobs.*

Due to the compact nature of some of the tanks, certain workers (of smaller than average height and build) do appear to have been selected for particular tasks more than others on several of the programs, a claim made by supervisors and workers alike:

*R - Yeah well the fuel tanks you know weren't that big, and it was mainly the smaller stature blokes that were used.*

*I - Was there any rhyme or reason to that, like was there anything that,*

*R - Size sometimes mattered where you went...there was some small tanks so obviously smaller blokes got them. And with that, especially myself, I'm not a real big guy; you got the smaller bays like the A4 I think.*

Workers further suggested that rotation provided an opportunity to relieve some of the boredom of the particular tasks involved, was to some extent negotiated amongst themselves<sup>3</sup> and was, as supervisors claimed, useful in that 'all hands' could be put to work to speed up the job:

*It was a shitty job...the more people that got in and got it done you know the easier it was on the other blokes you know...the hardest part of it was to, to keep the guys motivated and interested in it...so they would try and rotate them around...the guys who were hand picking used to get bored so we used to just swap them over and put them back on disassembling and the guys would come over and just sort of rotate them around as much as we could.*

However, interviews also suggest similar rotation obtained during non-Deseal/Reseal, but *associated* duties, not included in the focus of the BOI, such as disposal and storage of sealants and solvents on-site. For other tasks associated with the program (disposal of waste chemicals, maintenance of chemical separator dam, clean up of equipment, disposal of rags, mixing sealants) supervisors again indicate no demarcation of roles, and also the possibility of chemical exposures during these tasks:

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<sup>3</sup> On some occasions this sort of self management could have negative consequences. One interviewee detailed the agreement that he and a co-worker had reached to rotate spending a full day (rather than then recommended 2 hours) inside the tank hydrolasing and a full day outside as a babysitter, so that on alternate days one of them could stay dry.

*I - So who was responsible for moving these drums basically (SR51)?*

*R - The guys who did the desealing.*

*I - Oh the same guys.*

*R - The same people.*

*I - Okay, yep. So that might have been anyone from a, from a mechanic to a,*

*R - From a LAC to a senior NCO.*

*I - Right okay. And um were there any spills that you know of there, when stuff was actually being moved?*

*R - Oh it spilt all the time.*

The above account is from the 1<sup>st</sup> program but this issue has been ongoing across all the programs, as the following comments from a supervisor about his duties whilst employed on the wing program indicate:

*R - I was out the back of the strip...and it had oh 20 - 30, 44 gallon drums everything...and they had the ah, ah the contaminated SR51 in drums...we still had to maintain them being there. ..we used to go out and mow around it, The guys; you used to make sure which way the wind was coming from. And even with full respirators on um you could still smell and you had respiratory effects from the SR51...it didn't take long. ..so it was very, very (?unclear) at that time and you know there was drums leaking everywhere, like behind and I thought I'm not going near that stuff.*

*I - So um what sort of effects did you get, you said you got, it didn't take long to get some?*

*R - Well at that stage um because I maintained there...we used to be one guy standing up wind, keeping an eye on everyone...and if you were down wind, you'd only be in the area for 10 minutes mowing. And I mowed for a while and I could just feel myself getting a bit dizzy. Whether it was from a mask and a lack of oxygen, Or the heat I don't know, but um I was aware of it so I just pushed myself out and I must have brought the supervisors out that were there for it, just to keep an eye on everyone...and make sure it was all going okay.*

In some cases exigencies such as unexpected rain meant that these duties were carried out with little PPE, in conditions that were quite likely to result in chemical exposures, as the following account demonstrates:

*R - But when that flooded (chemical separator dam) we had to go and race down there and do it and some of us were just in normal overalls. I remember a couple of us who were down there we had*

*three or four troops, there was a flight sergeant himself, sandbagged around the outside of it.*

*I - So it was a real kind of we're running out of time we have to just*

*R - Yes, we've got to do it now...well it was overflowing. It started overflowing when we got down there and then we had to get the sandbags and by the time we started getting them down of course there was some overflowing naturally.*

All accounts indicate, as with direct fuel tank work, there was no link between mustering types and roles regarding associated tasks. However, workers suggest that there were staff dedicated to mixing in the sealant hut at least at various times and over various periods. One worker recalls that during his involvement disposal of SR51 was undertaken by a mature aged corporal who preferred to involve others in this task only if absolutely necessary. Another informant claims that two designated staff members (one male, one female) did all sealant mixing for a period on the spray seal program. The point, in terms of the larger project is that who did what at what point during the various programs is possibly not recoverable from official records. We would suggest on the basis of these findings that whilst muster categories can be used to identify those most at risk of exposure (ie in the case of airframe fitters on the 1<sup>st</sup> program) the actual tasks undertaken (associated with fuel tank repairs) cannot be simply read from these. Further we suggest that in the case of disposal and storage of chemicals, musters are even less appropriate as a guide to possible tasks undertaken/related exposures, and individuals should be given scope to indicate what their particular experiences and duties may have been in this regard.

## **Reported Health Problems and Symptoms**

In line with the findings of the BOI the vast majority of those interviewed believe they have permanent medical conditions as a consequence of their employment on F-111 Deseal/Reseal duties. Reported health problems and symptoms associated with Deseal/Reseal employment are many – ranging from ailments which could be classified as ‘tolerable’ through to many more serious and far more debilitating ailments. The previous breakdown of the health problems and symptoms reported by informants included in the interim report linked these to the tasks done by individuals and to the type of exposure experienced. Details of diagnosis and treatment were

given and whether the problems and symptoms noted confirmed those identified in earlier investigations was indicated.

As part of this report, we also considered reports by workers of the development of symptoms over time. In the case of one of the most commonly reported symptoms, both in the current study and in the BOI, symptoms do appear to linger over time. The headaches experienced by many workers whilst working with MEK and MILSPEC particularly, seem to have persisted.

*I used to suffer headaches...Still do suffer migraines. Um that depended on whether I got a real good lung full and I'd probably, I'd usually end up with a headache that afternoon within probably 4 to 5 hours sort of thing.*

*I used to get headaches too but you know. I get headaches now. I never used to get headaches before that, never. Never had a headache until I went on the deseal program. It must be the smell. I get headaches now occasionally but not so bad. But I still get them in my 40s.*

In some cases, migraines of some severity, requiring hospitalisation on occasion, have developed ("S" represents spouse of interviewee):

*S- And the migraines got worse.*

*R - Ah they got worse yeah.*

*S - And every time he gets one he's got to go to hospital...So I ring the Ambo here and they just take him to hospital.*

*R - Yeah a jab in the date with Maxolon and a dose of Pethidine and they put me out for 4 hours and,*

*S - If they start that's it.*

*I - So they're quite severe?*

*R - Yeah if I don't catch it beforehand I'm cactus.*

These migraines, and in an equal number of cases hay fever like responses, are often triggered by exposure to household chemicals, perfumes and other strong smelling chemical substances:

*R - Yes. Headaches (were) continual while I was on it.*

*I - And you hadn't had headaches prior to the program*

*R - No. I felt especially when using the MEK. Even today, now, like (my wife) using some household cleaners, I can't stand it. It just*

*gives me an instant headache. It's really bad. A lot of the time we don't use those cleaners nowadays because they just give me a headache.*

*I still have headaches. If I go around chemicals, it really does give me an instant headache. Sometimes it's weird.*

*Perfumes or um...Detergents, soap powders stuff like that....um like I can't walk down the soap powder aisle in a shopping centre, that's gets me going, starts clogging up, um tightness of the chest and I've got to get out of it. Ah I can't walk through, like if (my wife) wants to go into bloody David Jones chasing perfume or something well my eyes, see you later dear I'll stand out the front.*

In the case of skin rashes, the evidence is of a more variable pattern. Some workers experienced dermatitis like symptoms or rashes at the time of their program involvement, some after a period of months or years had elapsed. Further, for certain people these had been an ongoing health problem, whereas others had only experienced skin problems during their program involvement or after it for a limited period. These different responses were not linked in any obvious way with method of exposure or particular work tasks:

*Um I didn't get skin rashes straight away, it only come out in me, um when I actually left and went to (another RAAF Base) a year you know, later on.*

*He reckons he suffered skin rashes all the time and he was a frame man...and he reckons he's suffered, he suffered skin rashes all the time but he reckons he hasn't got them now....well with me it was different, I didn't get them straight away they came later.*

*I myself didn't experience anything, not at that stage....Well (later) I came up with skin rashes.*

*R - I'd get rashes down me legs, especially with MEK cause those, you'd notice it'd start like a bit of a burning sensation on your...your skin. Especially, cause there was these Tyrex suits and that and they're kind of like papery...and um I'd end up, that's how, how I ended up getting like a lot of rashes and that.*

*I - What about since being on the program, um has there been, I mean has your, for example your skin allergies or rashes have they, have they...got worse or?*

*R - No they're fine, like nothing, everything has cleared up on my legs.*

*R - But I still get a, a recurring like, I don't know what it is, a dermatitisy thing...on my fingers.*

Possibly a complicating factor here is the room for misunderstandings to occur about what is a rash, what is dermatitis etc, and we would suggest these conditions be referred to in the broadest term possible to capture the full range of responses to this line of questioning.

It is also worth noting here that issues of self-reportage of symptoms should be considered by those conducting the wider study. On more than one occasion, interviewees denied having experienced health difficulties of any kind when directly questioned on this matter. Considering the delicacy of certain common symptoms of chemical exposure (impotence) and the challenge to some men's 'masculinity' presented by discussing experiences of psycho-social impairments (mood swings and/or depression) this is hardly surprising:

*S - He denies it but he does...Well but he does, he does have them.*

*R - Oh dear yeah anyway.*

*S - He does have some shocking mood swings sometimes.*

*I - Yeah.*

*R - Yeah well I don't, I'm conscious of it...I'll be honest with you...but it's, I just think it's a personal thing myself um...you know like I do, I do and I don't like sort of admitting to it. I um, I have my good days and bad days I suppose.*

*I - Yeah, oh sorry I didn't mean to make you feel uncomfortable with that.*

*R - No, no that's fine I, I um, I wasn't going to mention it but I must admit,*

As the above account shows, the presence of a spouse who was willing to discuss such issues at interviews allowed the topic to be broached, and provided a 'check' on participants' accounts that was extremely useful in many instances. Perhaps the questionnaire used as part of the larger study could fruitfully include a section for spouses to fill out, with similar verification and accuracy purposes in mind.

## The Work History of Personnel

Although our qualitative sample was small, exploration of work histories, both prior to and post workers F-111 program involvement identified some potential complicating factors for the larger study to further explore. In the case particularly of interviewee's who had a long work history within the RAAF, reporting of chemical exposures *outside* of their F-111 program work was commonplace. These exposures ranged from having worked with some of the chemicals used within the programs during routine fuel tank maintenance on aircraft apart from F-111s over many years of service, to working with identified carcinogens and other hazards in previous musters and postings as in the following case:

*I - So um in all postings basically there's constant exposure to chemicals. Um South Australia was exposure to um lithium, lithium sulphide...we had a couple of minor leaks out of um torpedo's but nothing major touch wood. That stuff knocks you on your ear, it's toxic. Um, but yeah see we were sort of handling it a lot more thoroughly I suppose...because it was toxic within a number of, you know a matter of seconds...*

*I - So more physical protection gear than you've worn at your other postings (on F-111 program)?*

*R - Yeah a lot, a lot more um, primarily more so at (another location) cause I worked as an Explosives Inspector, so you know phostium(?)<sup>4</sup> gas was a common one that used to come up in a lot of ah packages of um explosive ordinances, as a by-product. Um and that'd give you bloody shocking headaches, it'd knock you on your ear. Um 9 times out of 10 you wouldn't be aware of it, you'd be working in a, a um inspection lab, which is um hydro, ah statically sort of earthed out, you're earthed out, you're working with the, um electrically initiated explosive devices and things like that. Ah you open up packets of chaff, packets...bad ones, really bad ones in the wooden packaging would be bulged from the gas build up inside...those ones we'd sort of pop and get out of the room, vacate it...and within about an hour, 1 1/2 hours, 2 hours you'd start getting a thumping headache and you've got to get out of the room. Ah the rooms weren't adequately ventilated.*

*I - Were you wearing any um respiratory gear or anything for those jobs?*

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<sup>4</sup> "Phostium" gas may represent "phosphorous" gas, given the context of the discussion.

*R - Nine times out of 10 no, primarily because ah it wasn't something you expected to come across...and a lot of the other stuff we were sort of exposed to that you, there was no initial indication um we had boxes of GBU things um which we had to inspect, they had had um moisture ingress and it had um caused or set up a chemical chain reaction with um the adhesive bonding that was used in making the things...and consequently when we opened them um there was masses of aluminium oxide, um ah breakdown, breakdown of the fins, the fins were bulged and we don't know what was coming out of those...that got tested but we never got the results back on that. Um, but yeah ah there's always been an exposure to chemicals right throughout but we're probably a damn site more cautious of it probably the last 8 years 10 years.*

In another instance, a worker discussed his long term use of two part mixes (paints), exposures to accidental spills and inhalations of dangerous substances over a twenty year career as a spray finisher of which the following incident gives some indication of the risks involved:

*We handled all the bad stuff, polyurethane paints are not good for you. I can remember working one day in the paint shop and somebody come running in...somebody said you know "is that priming and that done yet? Throw it out in the waste now and clean your gun." "Why what's wrong I'm using it you know." "It doesn't matter, don't use it, throw it away it's quarantine." Like we were using this, apparently there was a big scare on with this primer, it was a yellow primer for polyurethane and apparently they found something wrong with that. We'd been using the bloody thing for 6 months or more.*

This next quote, although referring to work in the private sector, is taken from a participant with a long history of employment within the RAAF in a capacity that had a high potential for chemical exposures, in *addition* to this private sector experience:

*Well I worked, I worked in private industry...for 4 years...there was one particular agent which we refilled, well there's no facility at all for protection, you know like there was no protective clothing or anything, I was rather concerned about that...that was called BCF...constantly you know filling extinguishers up all the time...And that's why that, they don't use it any more it's been disbanded. So it maybe, I um, I might have had some um you know problem with that.*

It seems clear from these and other similar work histories that younger personnel, with a limited career involvement with the RAAF, were on the whole less likely to have had such a history of sustained exposure to a broad range of hazardous chemicals, and we would suggest that on the basis of this participants in the larger study be screened both for length of time in RAAF employment and their pre or post program placements in particular musters involving routinely high exposure risks.

## **The use of Personal Protective Equipment by personnel**

Regarding the use of personal protective equipment (PPE), data from the qualitative study largely confirms the findings of the BOI. Namely, there appears to have been a progressive increase in PPE use over the successive programs associated with F-111 maintenance, due to a greater focus on PPE by RAAF management over time, greater perception of risk on the part of workers, and increased flows of information relating to the chemicals in use within the organisation.

Informants reported that, in line with the findings of the BOI, use of PPE was minimal during the 1st program. At most, the white cotton overalls, gloves and half face shield that were standard issue were worn, and more often shorts and a t-shirt were adopted. The reasons for this included a general lack of provision of adequate PPE, and of PPE tailored to the work task. The former led to 'scrounging' of resources from other sections and improvisation on the part of workers seeking to protect themselves. The latter led to PPE that made work tasks difficult or impossible to complete, as in cases like this:

*And we'd pump air conditioned air into the tank...and then they'd decide because of the close proximity of, of the walls or the limited space they were working in...to dispose of some of their protective equipment...um be it a mask or a set of goggles because you physically couldn't do it in some areas...um it was an accepted thing that if you couldn't fit then you did the best you could...but the job had to done either way.*

The overriding importance of completion of the job is also referenced by this quote, a point that will be taken up again in the final section of this report. On the non-use of PPE, the perception of risk amongst workers and their immediate supervisors at this time was low, reducing the likelihood of sustained concern and/or complaint.

Finally, the lack of formal training meant that any safety procedures which were in place were transmitted to new workers only via fellow workers and not supervisors, and so practices associated with poor use of PPE were passed on to newcomers as simply 'how the job was done'.

*It wasn't an issue really. They gave you this spiel but it wasn't like nowadays, it's really bought up in your face. Those days it wasn't. I can't knock the supervisors. That was the gear they had, they just said there's your gear basically. Nowadays people are more intense on you've got to wear it, put this on. Those days they weren't as pressured. They explained things to you like the water pick, they showed you things and that's how it went.*

As suggested both in this report and the BOI, the task of disposal of chemicals used in the F-111 Deseal/Reseal process was reported to be particularly fraught with risk as the minimal PPE employed by fuel tank and hangar workers seems to have been abandoned altogether when the same personnel (or in some cases other Base staff) were engaged in decanting, burning or otherwise disposing of waste chemicals, making this task a key exposure hazard to consider along with fuel tank work.

For the later programs, again, the findings of the BOI regarding the use of PPE were largely confirmed in the qualitative data. Specifically, workers did complain about deficiencies in PPE:

*Depends on how volatile the stuff is what you're using, a lot of the guys would suffer headaches and um you know the usual things like that. You know you'd get out of there, your respirators, the half face respirators we were using at times, um they weren't a perfect seal, you know you'd take them off and you had a mark on your face,*

And sometimes also about a lack of PPE resources:

*R - Yeah, but sometimes there wasn't, we'd run out of a lot of the gear...and it'd be like we really need some more gear and then we'd scrounge around and get some more and sometimes you just, by the end of the section you'd hardly have any gear left.*

*I - Okay so you might be looking for a pair of gloves or a mask or suit?*

*R - And you'd be reusing like,*

*I - The stuff you'd already,*

*R - The stuff that you'd already used yeah.*

The lack of comprehensive PPE training and instruction was also an ongoing factor mediating against use of PPE, although things had improved in this regard over time. This worker described the generalised lack of clarity regarding the specificities of matching PPE to different work tasks, even if a general sense of the necessity to be protected was understood:

*R - It was all, we all knew that PPE was the go, but then it really wasn't clear what um like in different things what you should be wearing...do you really need to be wearing this doing mixing or do I really need to wear a whole full suit. Cause a lot of times it was just um oh fairly inconvenient to go putting on ah like a big suit and a full face air supplied mask...which we didn't, you wouldn't have been able to put on an air supplied mask cause we didn't have the equipment. We only had enough equipment to run the guys ah with the um, I don't know if you've seen the air, air supplier, um like a saver unit? We used to call them a saver unit anyway, it's a breathing apparatus unit and then they have the airlines coming off that and it supplies air to them.*

*I - So there's only enough for those guys who were actually inside the aircraft?*

*R - Yeah.*

This excerpt demonstrated the interrelationship of issues in regard to the use of PPE on this program. Several facets of influence are interleaved in this quote; the interaction between issues of worker reluctance to adopt PPE (convenience) and that of supply (limited hoses; and the confusion regarding what was necessary PPE in what situation discussed above); the higher levels of PPE use amongst those actually inside tanks, rather than those directly outside them. Both volumes of the BOI report identify workers outside tanks as being less obviously at risk of exposure than those

working in fuel tanks, but notes that their exposures may have been *significant* due to their reduced likelihood of PPE use, as discussed above in relation to disposal issues.

During the 2<sup>nd</sup> and later programs, time pressures mediating against workers 'suing up' to clean and or repair equipment for tank workers while jobs were in progress contributed to this practice amongst these workers, as indicated below:

*Um you used to squirt that over it and then you used to just use your fingers and smooth it off. And if you ran out of leak check and you were in a hurry and you couldn't get the job, like you couldn't go back in to get more leak check you use to use spit, spit on your fingers and work it over. You know there was never any sort of major considerations for um for PPE. Ah like it was never drummed into us you've got to watch this stuff it's um, it's toxic, yada, yada that was sort of immaterial. The only time it was sort of considered was if you were working in the um, in the fuel tanks or you know, and that was tied in with the framies and um mainly. Cause if they were inside the tanks well then they had to have the full respiratory gear on plus you had to have someone sitting above them, as a um, sort of like a safety watch.*

*As a runner like, and you'd be running around in there, and that's where another thing where you probably wouldn't wear, the PPE was lacking...cause you'd be the only one there, ah the guys have got a problem with the gun "oh quick run in...oh shit the spray sealant is running out", I've got to go and mix some more of that up too*

*If there was a problem with the gun guys would be standing there with suits on the aircraft and guys would walk up with, with nothing on and grab the gun to bring it back down and clean it up...Or fit a new tip on it or spray tip, and then go oh yeah it's alright I'll try it out...and try it out in the booth ssshhh, yep it's right*

*It was like MEK you know it was pretty potent...a lot of times you didn't wear the respirator you know you'd be doing a little job, you'd just get a rag and upend the gallon can as it came in...and just give something a quick wipe with it and oh right that's right now.*

That the relationship between time pressures and use of PPE works in complex ways can be seen via discussion in the following excerpt. Initially, this participant indicates that curing times for primers may not have been observed when in a 'rush'.

This means that PPE which may have been adequate had procedures been observed, would perhaps be less effective even if worn due to this response to time pressures, or, further, that these may lead to it's abandonment:

*R - we may cut corners, that there may be things that we'd have to you know rush you know. Where you'd say, like it does you'd say right you know the book says you'll apply that and it'll give you an hour to dry before you do this or, you know you'd cut that, you'd chop that in half...Or sometimes guys were there betting with the others with what we could get away with you know. Oh yeah you'd start chopping and changing a bit to try and push it through because the pressure was on you all the time.*

*I - Alright so as well as cutting down the curing times what other sorts of stuff might change?*

*R - Um well you would cut down, you would cheat on your safety issues too...if there was a job where you had to brush out quick and easy well you'd get all rugged up in your gear and you'd say bugger this you know...the pressure is on you to get it going, you'd have to get it out of here, you might not get rugged up in all the gear, you might just whack a half face respirator on. Later on they had slightly better stuff and you'd just do the job quick, say there you go it's done get it out of here you know.*

Note though the interviewee indicated that the 'better' PPE provided in later programs he was involved in (in this case better respirators) were more likely to be used as it was less likely to impede work progress. It is also worth mentioning that beyond the issues of supply, efficacy, and cultural influences on the use of PPE, some participants had chosen not to 'go with the flow' after seeing others in situations they considered 'risky':

*R - I remember the day where I was mixing or I was on the bench cleaning up something with MEK and I looked over into that spray booth and people, and there was a guy there with nothing on, shorts and t-shirt or overalls, and he was spraying through, he was cleaning the system with um MEK and you could see from the light...Just this MEK coming, like the mist and coming back on him. And I've just gone, and just, I like I said to him "you better watch it" and "oh it'll be right mate, I'm only going to be a minute" and.*

*I - He was fairly dismissive of it then?*

*R - Yeah but you could, standing back you could see it just in the light this ah mist coming back on him...like the overspray mist.*

This participant claimed to religiously employ all the PPE available to him after this incident because of the impact of actually seeing someone bathed in a mist of chemicals in this fashion. Taken as a whole, the implications of the analysis in this section for the broader study were that PPE use was variable across programs and within them, and therefore care should be taken to carefully document the particular circumstances and experiences of participants regarding this facet of their program involvement.

## **Base Culture and the Broader Cultural Context of Work at RAAF Base Amberley**

The term 'Base culture' is used in this report as an umbrella term, encompassing several constituent concepts employed to examine how the workplace culture at RAAF Base Amberley (at the institutional level) facilitated and influenced a certain set of workplace experiences for personnel on the programs. This influence was, as acknowledged in the BOI, in turn shaped by broader military, governmental and social structures. These larger forces though are beyond the scope of the present study and have been adequately explored by the BOI. We are however in a position to comment on worker perceptions of and responses to the Base culture that they encountered. Within this section we define Base culture as a form of institutional culture, that is "the deeply embedded patterns of organisational behaviour, the shared values and assumptions, beliefs and ideologies that members have about their organisation or its work"<sup>5</sup>. This culture provides meaning and context in the lives of personnel over time and indeed was argued to be changing over time, by some participants, if slowly:

*R - Culture and discipline was a lot different in those days to what it is now...you've got a lot of people out of what you call the old school. Some of them were ex WWII some in that hierarchy and a lot of that was the people in it who were ex Korean War, that type of thing. It was discipline and you took notice of what they said. And it was an*

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<sup>5</sup> This was taken from the definition of institutional culture in a tertiary education setting by Peterson and Spencer, 1991, p142.

*entirely different situation to what it is now. Now it's more you can think for yourself a little bit. But I noticed a big change in discipline about 1982-83. That's when I noticed it...and I think the Air Force was really the old school and the Army, Navy, Air Force were all the same. I think things changed as they started to get complaints.*

*I - So that old school mentality and these people from WWII and what have you backgrounds and things, how would that impact on your day to day job and how was it different then from today.*

*R - It was more of you get the job done and worry about the consequences later I guess. It was more of that style than what they are looking at now. As a matter of fact this has probably been a good thing. I know the backing of the Air Officer xxx apparently he said he doesn't want to see anything like this ever happen again. He said it's happened but he doesn't want to see it again. But the situation is entirely changing too with why people sue and everything else.*

However, the analysis of Base culture in this section indicated that the workplace culture at Amberley still had productivity<sup>6</sup> as its guiding light during the F-111 programs, with the ramifications of this for worker's health and safety being manifold. As such, this section of the report again confirmed findings from the BOI of the existence of organisational and cultural factors that contributed to the overall ill-health outcomes of some personnel on Deseal/Reseal duties. It also aimed to briefly demonstrate the relationship between Base culture, risk in everyday workplace practice with regards to health and safety at Amberley, and the ill-health outcome of personnel over time.

The existence of a specific work culture that influenced attitudes to work safety at Amberley RAAF Base was clearly recognised, if in retrospect, by F-111 personnel, as demonstrated in the following comments. Support for this statement can be found throughout the interview excerpts gathered in this report. Note that pre-existing practices and attitudes are deferred to by new entrants to the programs in these examples:

*And I think that because personnel changed quite regularly that you just sort of adopted the culture that was there when you came in.*

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<sup>6</sup> To a certain extent the learned ethic of 'being productive' and 'doing one's duty' is a feature of a modern industrial institution where one's identity was first and foremost that of a productive worker in a structure and logic time frame (Bauman Z. Community: Seeking safety in an insecure world. Cambridge Polity Press, 2001).

*I - Did anybody ever feel like they, there should have been or they would have liked to have had some sort of gear on when they were dumping stuff or?*

*R - Um possibly. I, I um, my attitude in those days is I, you know we had a job to do and we, we did it you know....and with what, and with what we had available.*

*Um, it was a, it was a job that wasn't um, you know um it was a job that we didn't look forward to doing but we knew we had to um get the things on the way, get rid of the stuff you know...The guys I was working with too I, you know were mostly older blokes and myself. I was a fairly, oh well I was um, I forget what was I was about 35 - 37 I suppose, but there were a few older guys that sort of just went with the flow, you know they were used to that sort of, environment so they didn't worry about it.*

As to the nature of this culture, the 'can do' attitude identified by the BOI is descriptive and is well supported by our own analyses. There are a number of aspects to this culture of achieving objectives 'no matter what'. These include the perceived inappropriateness of complaint, both because of the fruitlessness of the action, particularly in the earlier programs (as identified by the BOI) but also because of the view that compliant somehow may constitute a claim to be treated 'better' than one's peers:

*We never used to complain because everyone was in the same boat, so even like the medical when you first got there and you're supposed to do it every so often but I can't recall them doing it too often. They did some checks. Never got back to you about it. So they did some tests... Really you didn't go into too much depth because you're all in the same boat.*

Additionally, as noted above, complaint was demonstrably unlikely to result in an improvement of working conditions, and was in fact much more likely to lead to some form of negative sanction:

*R - And it was just a, um you know, if you want to make a wage you just do the job you know....and get back to it.*

*I - So even if people were a bit nervous about it or whatever they probably wouldn't have,*

*R - They wouldn't have said anything, I don't think so....I don't think so. If you were delegated the job you did you know. You were in a, a sort of situation where if the Corporate told you to jump you had to do it you know...um nothing, not as much as, like it is today where you*

*can you know justify if there is a question, you know you ask the question.*

*My Sergeant...he said well you know, one guy refused to go in and he went back to the warrant officer, ah who I won't mention his name, but he said "well you know he's refused to go in what do we do?" He said "well tell him to go in or he'll be charged" you know. So what option did you have? You know so; you didn't do your job so you got charged for it.*

*You'd either be slammed in jail or you'd be fined money and, in the old days you were all young blokes with little kids and families you know, you wasn't going to wear that, so you more or less did as you were told and don't complain. You were told not to complain if you did complain.*

*You know you can't argue, you go down there you're only wasting your time anyway, you may as well stay here, stay here do the job and get it over and done with as quickly as you can and then it's gone you know, it's out of the way.*

Here, it is evident that Base culture was centred on 'not complaining' and 'getting on with the job'. It is also interesting to note, as indicated in the last comment that reluctance to report problems was also influenced by the desire to complete an unpleasant job in the shortest time possible. Many interviewees voiced this opinion, and it seems that in light of the lack of response they expected, many felt that complaint would merely serve to slow down the job, which it was in their *own* interests, as well as imperative, to complete quickly.

The flow on effects of this cultural milieu included a lack of communication between personnel across ranks about ill-health symptoms, problems and job dissatisfaction that personnel might be experiencing. Additionally, the notion of 'trouble makers', which often arose during the interviews, is also defined in relation to the 'can do' attitude. Often personnel were dissuaded from making complaints, reporting problems or symptoms or questioning command procedure, lest they be labelled a 'trouble maker', and thus not to be listened to in a generalised way:

*But mine was doing that and I thought shit maybe I've got this bloody chromite poisoning. But being like a dumb shit, you know typical of me you know and a lot of they guys were the same never, I'd never go to medical and complain about it...We'd laughed at it you know*

*years down the track, and we think oh bloody rash off the toilet seat, it'll go away probably you know one day*

*(Supervisor) You had a few that would complain but virtually you had to settle them down because we were in a situation that we practically had to do. That made it very hard but that did happen.*

Base culture was characterised by an ethic of silence emphasising a 'don't whinge', 'get on with it' attitude, where personnel were dissuaded from questioning commands. The pervasiveness of the perception that 'complainers' were just trying to shirk an unpleasant job, rather than having real cause for complaint, is indicated in the following comments made by one worker about a colleague at the same level as he.

Rather than being perhaps employed by superiors to justify decisions, the following indicates that this understanding of 'complainers' as 'troublemakers' obtained at *all* levels:

*One of the guys that was on the first one with me lost his voice...we all thought he was joking at first... You used to just think oh yeah (name) is trying to get out of this, you know it's a shit of a job and he's just, he's put this on because he wants to get out of it mongrel, you know. And it leaves us to do it you know, he's a bit of a bludger, he's nicking off and he's getting out of it, and he got a bloody clobber full then...Well it worked out that way that he wasn't bloody joking...you know after it, after we'd done the first one and he'd lost his voice, he was starting to go through...traumas with medical and they'd be sending him to specialists. And we tried all kinds of tricking to see if he was kidding but he wasn't. He was dead genuine. And then when that happened we all started to look at one another and think hey what's with this stuff you know...and we all started to worry then a little bit you know, um but we still had to do it*

We can see below the direct effect of the 'can do' attitude inherent in the Base culture and noted in the BOI comments on safety at work. This is represented as the concern with 'making do with the resources available and if necessary deviating from required safety procedures in order to get the job done', which was so evident in many of the programs:

*You can't do much about saying well you know I haven't got the right cartridge I'm not doing anything, it was you know, there's a set of cartridges load them in and go...you couldn't argue really you know you more or less, you had to do it, it was your job and you more or less, it was there's your job, you get in and do it.*

Management at a relatively high level was not exempt from the constraining influence of this cultural construct as can be seen in the following quote from a senior engineer on the spray seal program:

*R - Obviously health and safety standards have changed substantially over the last 10 years or so, people are becoming a lot more aware of it. So if you judge it by today's standards then yes there were things that should have been done that weren't. But judging it by the standards of the day um I think probably the main thing was you know I would have liked more um I suppose empathy and um understanding from the environmental health people*

*I - So you feel the health and safety people didn't take your concerns seriously is that what you mean or they,*

*R - Well I felt like you know I was whingeing you know. With the environmental health people, "oh yeah you know there's nothing wrong with those levels they're right." And I was going "you know but people have got headaches" you know.*

*So I suppose that was probably the main thing at the time, that I just sort of felt you know maybe, you know they weren't taking us seriously enough...from memory I think I just felt that they were sort of saying 'oh yeah you know your headaches and everything is...I mean that so you'll be right sort of thing'.*

The consequences of the Base culture's priorities and associated attitudes, as well as working in a high-pressure environment, affected workplace safety knowledge and practice in alarming ways and often resulted in problems with use of personal protective equipment and the monitoring of safety practices and exposure. The perceived 'trouble-maker' attitude in particular prevented safety issues from being discussed. It is clear that productivity was a high priority and safety was very often neglected. We would counsel caution when constructing questioning of participants in the broader study, as it is clear that some of these attitudes persist, particularly in those with a strong sense of loyalty to the RAAF, and a wish to avoid being seen as 'whingers' even in retrospect.

## SUMMARY

The focus of this report has been to explore 6 main topic areas: membership and participation in an F-111 Deseal/Reseal program, the demarcation of roles therein, reported health problems and symptoms of those involved; the work history of personnel; the protective clothing and equipment employed on the programs; and the cultural context of F-111 work practices at RAAF Base Amberley.

The analysis of interview transcripts identified some important findings, which will be of use to the wider research team and to help inform the General Health and Medical Study.

The bulk of the findings confirm those reported by earlier investigations examining the F-111 Deseal/Reseal program. In particular, both the reported health problems of interviewees and their descriptions of task demarcations on the program confirm the details outlined in the BOI. Similarly, the majority of interview data regarding who was involved in the program also matches those identified in the earlier documentation. However, supplementing such findings, the interviewees also report possible new classifications of mustering not already outlined in the BOI but which may have some significant level of chemical exposure, either by virtue of working in close proximity to the F-111 programs, or being engaged in disposal and or storage tasks associated with these programs.

The use of PPE across the programs has been shown to be more complex than perhaps was initially assumed. Further, we have suggested that the prior and post program work history of personnel may be important to note in the drawing of the exposed and comparison cohorts. Finally, understanding of the 'Base culture' that developed over time at Amberley has been highlighted as an important resource for understanding the actions of RAAF employees on the F-111 programs.

**Main Findings/Recommendation**

Interviews reveal new key groups (not directly related to Deseal/Reseal Program duties) who may have experienced some level of exposure: firemen, structural fitters and those working in administration huts on the Base.

**Action taken**

Created “F-111 Deseal/Reseal related activities” category for the General Health and Medical Study.

As a result, it is recommended that the larger study redefine the identification and exploration of working activities to include those not directly involved in the F-111 Deseal/Reseal programs but undertaken in close proximity to the program.

## **APPENDICES**

### **Appendix A : Information and consent package and reminder**

A1 - Letter from the Chief of Air Force (1 page)

A2 - Information Statement (4 pages)

A3 - Informed Consent Statement (1 page)

A4 - Reminder (2 pages – would be printed A5 size on card, double-sided)

# AIR FORCE HEADQUARTERS

CHIEF OF AIR FORCE

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R1-6-C001, Department of Defence, CANBERRA ACT 2600, AUSTRALIA

CAF /2002  
DWSPO

## **To F-111 Deseal Reseal Staff Invited to Participate in the Health Study Personal Interviews**

I am writing to encourage you to support the personal interviews that are being conducted as part of the initial qualitative study for the Study of Health Outcomes in Aircraft Maintenance Personnel (SHOAMP).

SHOAMP is being undertaken as a result of a Ministerial directive to Defence and the Department of Veterans' Affairs (DVA) to look at different aspects of the health and wellbeing of Air Force personnel and contracted civilians, both past and present. The University of Newcastle is conducting SHOAMP on behalf of Defence and DVA.

The qualitative study will be conducted by especially trained staff from the University and will involve a small number of participants from each of the F-111 Deseal Reseal programs. If you accept the invitation to participate, you will have an opportunity to talk about your involvement in the Deseal Reseal programs, your work activities, any health problems you may have experienced and how you are feeling now.

The information gained from the interviews will help the team from The University of Newcastle further develop the approach for the main study. The team needs to understand the types of work activities that could have led to people being at risk.

Your participation in this project is your choice. Any information that you provide will be treated in confidence and any answers attributable to you will not be given to any third party, including DVA or Defence. All project protocols have been considered and granted approval by Human Research Ethics Committees from Defence, DVA and The University of Newcastle.

This study has my support, and once again I encourage you to accept the offer of an interview.

Yours sincerely,

**A.G. HOUSTON**

Air Marshal  
Chief of Air Force  
March 2002

# Study of Health Outcomes in Aircraft Maintenance Personnel

## Information Statement

### Introduction

The “Study of Health Outcomes in Aircraft Maintenance Personnel” (SHOAMP) is a collaborative study involving researchers from the Hunter Medical Research Institute, on behalf of the Department of Veterans’ Affairs. The main project office for the Health Outcomes Study will be located at the Centre for Clinical Epidemiology & Biostatistics, part of The University of Newcastle.

The Health Outcomes Study aims to investigate whether there is evidence to support the anecdotal reports of adverse health problems in personnel involved in the F-111 fuel tank deseal/reseal programs that took place at RAAF Amberley in Queensland.

The Study involves several different phases of investigation. These include an extensive literature review, identification of personnel exposed to potentially hazardous agents during their deseal/reseal activities and a small number of face-to-face interviews. There will also be comparisons of a number of health conditions experienced by F-111 deseal/reseal workers with other RAAF personnel.

This Information Statement is to let you know about the first step in the Health Outcomes Study, which involves a series of face-to-face interviews with people who were involved in any of the phases of the deseal/reseal programs.

Your name was selected at random from Defence records of personnel involved in F-111 deseal/reseal activities. The selection and invitation of personnel to take part in an Interview was carried out by the Department of Veterans’ Affairs on behalf of the Department of Defence. The research team has not had access to any of your personal information (name, address etc), and will only learn these details if you choose to accept the offer of an interview and return the consent form. Your privacy is a primary consideration of this Study, and all project protocols have been considered and granted approval by Human Research Ethics Committees from the Australian Defence Department, DVA and The University of Newcastle

This Study is important because of the investigation into health problems associated with the F-111 deseal/reseal programs. In addition, some of the chemical agents to be investigated are possibly associated with other activities still being conducted within the RAAF today, and we hope that our results may help to inform a safer workplace for all.

## **The Health Outcomes Study and the Health Care Scheme**

As you may be aware, there is a scheme administered by the Department of Veterans' Affairs which provides specialised health care to those ex-service members whose health has been affected by their work on the F-111 deseal/reseal programs. This is the F-111 DSRS Health Care Scheme. It is entirely different from our Health Outcomes Study.

The Health Outcomes Study will involve an extensive assessment of a range of measures relating to the health of workers involved in the deseal/reseal programs. These results will be compared to the health of a second group of Defence personnel who were not involved in the programs. The entire Study will follow strict research methodologies and will be overseen by a Scientific Advisory Committee.

Eligible individuals can take part in both the DVA Health Care Scheme and the Health Outcomes Study. Taking part in one does not exclude a person from the other. Of course, for SHOAMP to be successful it is vital that as many individuals as possible participate, and we would encourage as many people as possible to register their interest. It is important to establish exactly which types of health problems are involved as a consequence of working on the F-111 deseal/reseal programs, and what the links are to different types of activity and exposure levels.

### **Description of the Personal Interviews**

Described as "qualitative interviews", these face-to-face discussions are essential elements of the exploratory phase of the Health Outcomes Study. Information provided during these interviews will help us to understand the types of work that caused workers to be exposed to potentially hazardous agents. Also how each person felt about their involvement and any health problems suffered during that time.

It is essential that the Study team be able to define the term "exposed" at the start of the project. This definition will determine who is eligible to take part in later phases of the Study, where the health of RAAF personnel involved in the F-111 deseal/reseal programs is compared with others who were not involved. Only through discussions with people like yourself, who were involved either directly with the F-111 program or who worked nearby, can we start to gain a better understanding of the problems encountered by workers, and conduct our Study accordingly.

Each Interview will be conducted by a specially trained Health Social Scientist, using a series of prompts. There will be a number of structured questions so that we can firstly gain an understanding of the types of work a person was required to carry out, and the types of equipment they used. Some information regarding the types of work carried out before and after the deseal/reseal programs would also be helpful, in terms of the other types of other exposures encountered as part of general work duties. Also, we can reassure current serving ADF members that volunteering for an Interview means you are still covered by Defence for any adverse events because you are considered "on duty", whether you choose to conduct your Interview during work hours or elsewhere outside of usual work hours.

A significant feature of the Personal Interviews is the opportunity for each person to “have their say” about their involvement in the deseal/reseal programs. If there are any particular issues you would like to raise regarding the F-111 deseal/reseal work practices, safety concerns and health conditions, there will be the opportunity to do so during the Interview. You should allow approximately two hours for your Interview. Breaks from discussion can be taken at any time, and you always have the right to terminate the Interview at any stage.

### **Confidentiality and privacy**

Any information you provide during your Personal Interview will remain completely confidential. Your discussion comments will be kept by the Study team at the Centre for Clinical Epidemiology & Biostatistics (The University of Newcastle) and will not be provided to the Department of Veterans’ Affairs or the Department of Defence.

Although the Interview will be tape recorded, it is only for the purpose of having your comments transcribed at a later date. There will be no information transcribed that would permit any individual to be identified. The tape recordings will be kept for the term of the Health Study and then cleaned of all information. It is the right of all participants who take part, to listen to their taped discussions in full, and edit or erase any part about which they feel uncomfortable.

To ensure the confidentiality of your Interview discussions, each person’s final discussion information will be allocated a code number. Any Reports resulting from the Personal Interviews will contain anonymous data only, and no individual will be able to be identified. We appreciate that some things may be difficult to talk about, but we guarantee that all discussions will be treated respectfully and with sensitivity.

Taking part in any part of the “Study of Health Outcomes in Aircraft Maintenance Personnel” is purely voluntary. If you choose not to participate there will be no detriment to your career or future health care.

***The Coordinating Committee for the Health Study thanks you for your cooperation, we look forward to your participation.***

.....  
Dr John Attia  
Senior Lecturer in Epidemiology  
Centre for Clinical Epidemiology & Biostatistics,  
School of Medical Practice and Population  
Health, The University of Newcastle  
.....

.....  
Dr Catherine D’Este  
Senior Lecturer in Biostatistics  
Centre for Clinical Epidemiology & Biostatistics,  
School of Medical Practice and Population Health,  
The University of Newcastle  
.....

.....  
Associate Professor Julie Byles  
Director  
Centre for Clinical Epidemiology & Biostatistics,  
School of Medical Practice and Population  
Health, The University of Newcastle  
.....

.....  
Dr Anthony M Brown  
Director of Population Health and Planning  
Macquarie Area Health Service  
Conjoint Associate Professor, Environmental and  
Occupational Health, The University of Newcastle  
.....

### **Contact details for the Health Study team**

Should you have any questions about the Personal Interviews, or the Study of Health Outcomes in Aircraft Maintenance Personnel in general, please do not hesitate to contact us. The best people to speak with are–

Dr Kate D’Este  
Study Investigator  
Centre for Clinical Epidemiology &  
Biostatistics  
The University of Newcastle  
David Maddison Building  
Royal Newcastle Hospital  
Newcastle NSW 2300  
Telephone: (02) 49236142

Ms Meredith Tavener  
Project Manager  
Centre for Clinical Epidemiology & Biostatistics  
The University of Newcastle  
David Maddison Building  
Royal Newcastle Hospital  
Newcastle NSW 2300  
Telephone: (02) 49236200  
Email: [mtavener@cceb.newcastle.edu.au](mailto:mtavener@cceb.newcastle.edu.au)

### **Contact details for Air Maintenance Personnel Advocate**

If you would like to speak to a member of the Defence Force who has knowledge and understanding of the issues involved in the deseal/reseal programs, please contact the F-111 Advocate –

Warrant Officer “Blu” Hind  
Telephone: (07) 5461 4516  
Free call number : 1800 558 022  
Fax: (07) 5461 4514  
Email: [F111Advocate@drnex.defence.gov.au](mailto:F111Advocate@drnex.defence.gov.au)

### **Concerns or complaints**

Should you have any complaints or concerns about the manner in which this Project is conducted, you may prefer to contact an independent person. Contact details for a representative from either The University of Newcastle Ethics Committee or Australian Defence Human Research Ethics Committees is as follows –

The University of Newcastle –  
Sue O’Connor  
Human Research Ethics Officer  
Research Branch  
The University of Newcastle  
Callaghan NSW 2308  
Telephone: (02) 49216333

Australian Defence –  
Raphaella Jarvis  
Assistant Executive Secretary  
Australian Defence Human Research Ethics Committee  
CP2-7-66  
Department of Defence  
Canberra ACT 2600  
Telephone: (02) 6266 3837  
Fax: (02) 62664982  
E-mail: [ADHREC@defence.gov.au](mailto:ADHREC@defence.gov.au)

STUDY OF HEALTH OUTCOMES IN AIRCRAFT MAINTENANCE PERSONNEL

**INFORMED CONSENT STATEMENT**  
**FOR THOSE PARTICIPATING IN PERSONAL INTERVIEWS**

I agree to participate in a Personal Interview with a qualified health professional, as part of the Study of Health Outcomes in Aircraft Maintenance Personnel.

In signing this consent form, I am declaring the following -

1. I have read, and I understand, the information about the Personal Interview in which I will be involved,
2. I understand that the Interview could take up to two hours and that I can take a break from the Interview at any time if I so wish,
3. I understand that my Interview will be tape-recorded for the purposes of transcribing an accurate record of my comments only, and that I will not be able to be identified from the recording,
4. I understand that any information I provide during the Interview will remain completely confidential and that any transcript of the Interview will contain de-identified data only, and will be used for the purposes of this Study only,
5. I understand that taking part in an Interview is voluntary, and I can withdraw my consent at any time, or end the Interview at any time, with no detriment to my career or to my future health care.
6. I understand that if I wish, I will be given the opportunity to review, edit or erase the recording of my Interview,
7. I understand that the results of these Interviews will be made available to me at my request, and any published reports from this phase of the Health Study will preserve my anonymity.
8. I understand that on receipt of my consent form, a member of the Study team will contact me by telephone or by post to arrange my Interview,
9. I have been provided with a copy of the Australian Defence Human Research Ethics Committee's "Guidelines for Volunteers".

Name ..... Telephone number .....

Signature ..... Date .....

Please place your completed consent form in the reply-paid envelope provided (no stamp needed) and return to the University of Newcastle. We look forward to contacting you soon.  
Thank you.

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If you have a complaint concerning this research and wish to speak with an independent person you may contact Sue O'Connor, Human Research Ethics Officer, Research Branch, the University of Newcastle, Callaghan NSW 2308, telephone (02) 49216333.

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## Study of Health Outcomes in Aircraft Maintenance Personnel

By now you would have received your invitation to participate in a Personal Interview, as part of the Study of Health Outcomes in Aircraft Maintenance Personnel. The Study aims to investigate whether there is an association between adverse health status and F-111 deseal/reseal maintenance activities. The Personal Interviews serve to increase our awareness of the deseal/reseal process and the types of activities which may have put workers at risk, as well as providing an opportunity for people to have their say about their involvement. The Study is a collaborative effort between researchers from the Hunter Medical Research Institute, administered by the Department of Veterans' Affairs on behalf of the Department of Defence.

If you have already returned your consent form to take part in an Interview, **thank you!** You will receive further information about your interview very soon.

If you have not yet returned your consent form, it is **not** too late. We are very keen to meet with you and learn more about the types of deseal/reseal work you carried out. Simply complete the consent form **now** and return it in the reply-paid envelope that was provided. If you have not received your consent form, or have misplaced it, you can call Meredith Tavener (Project Manager) on 02-49236200, and have another copy sent to you.

If you have any questions about the Health Outcomes Study, you are also welcome to speak with a member of the research team, or an independent representative from either The University of Newcastle Ethics Committee or the Australian Defence Human Research Ethics Committee. All contact details are provided on the reverse of this card.

***We would appreciate your participation. Thank you.***

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For questions about your Personal Interview, the best people to speak with are –

Meredith Tavener  
Project Manager  
Centre for Clinical Epidemiology & Biostatistics  
C/- David Maddison Building  
Royal Newcastle Hospital  
Newcastle NSW 2300  
Phone: 02 49236200  
Email: [mtavener@cceb.newcastle.edu.au](mailto:mtavener@cceb.newcastle.edu.au)

Dr Catherine D'Este  
Study Investigator  
Centre for Clinical Epidemiology & Biostatistics  
C/- David Maddison Building  
Royal Newcastle Hospital  
Newcastle NSW 2300  
Phone: 02 49236147

To speak with a member of the Defence Force who has knowledge and understanding of the issues involved in the deseal/reseal programs, please contact the F-111 Advocate –

Warrant Officer "Blu" Hind  
Phone: 07 5451 4516  
Free call number : 1800 558 022  
Email: [F111Advocate@drnex.defence.gov.au](mailto:F111Advocate@drnex.defence.gov.au)

If you would prefer to speak with an independent person, you may contact –

The University of Newcastle  
Sue O'Connor  
Human Research Ethics Officer  
Research Branch  
The University of Newcastle  
Callaghan NSW 2308  
Telephone: (02) 49216333

Australian Defence  
Raphaela Jarvis  
Assistant Executive Secretary  
Australian Defence Human Research Ethics Committee  
CP2-7-66, Department of Defence  
Canberra ACT 2600  
Telephone: (02) 6266 3837  
E-mail: [ADHREC@defence.gov.au](mailto:ADHREC@defence.gov.au)

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## **Appendix B : Pilot interviews - themes to explore grouped by relevance to stated aims and objectives**

These questions are not to be employed in a standardised way. They act only as guidelines to provide thematic structure to the interview while allowing flexible exploration of key areas of inquiry.

### **Level of exposure, spatial geography of workers and production requirements**

- When were you working on the program (dates: month, year)?
- Duties? What extent/periods of direct contact/proximity did you have with tanks and deseal/seal tasks?
- Part-time/Full-time?
- Can you take me through a typical day on the program?
- Where were you working? (what section of plane/tanks)? For how long (per day plus overall in terms of days)?
- People on program – who was involved (including demarcation of roles on the shop floor = support crew, tank crew, etc)?
- People working directly alongside informant (working independently/in teams)?
- What were the production requirements facing workers on the program? At peak times?
- Spatial geography – who worked close by, (either directly or indirectly working on tanks)? What contact did these others have with you and the tanks?

### **Further definition of work place practices, equipment used, (non) adherence to safety procedures, occupational history before/after deseal operations?**

- What protective measures were employed? Protective clothing or other protective equipment used? What was the access to such equipment? Were there difficulties in using these? Did you use or employ any such protection while working on the program? Other workers – what was the general attitude of workers on shop floor to such protective measures? What were the official safety procedures for the program workers? Were these administered successfully? What was the attitude of shop floor workers to such procedures? Adherence/non-adherence to safety procedures?

Physical set up of shop floor – can you describe the working environment for me?

Windows and ventilation, air conditions generally? Other pollutants present?

- Chain of command – what working relationship did you have with the management/supervisors on the program? What were your impressions of the management/supervision of the program? What was the level of supervision? Did this vary at all? If yes, with regard to what?
- Occupational history before/after deseal operations? Did you work elsewhere before joining the program? Have you done any other jobs on the program? Are you still working on the program? Any other employment since?

**Workers' awareness and perceptions of problems and sense of risk with the deseal/seal program(s)**

- Past and current health problems? Personal experiences of these problems? Symptoms?
- Linked to the program(s) and work undertaken there? Are you aware of any risks/dangers linked to the deseal/seal program and the chemicals used? Do you know/did you know what the chemicals being used were? Their chemical make-up?
- Were you aware of any such dangers at the time of working on the program? Were any dangers/risks highlighted to you or information made available to you while working on the program? More recently? If yes, can you please describe and what was your perception and how was it received generally on the shop floor?

## Appendix C : Theme list for semi-structured interviews - Supervisors and organisational figures

### Level of Exposure, spatial geography of workers and production requirements

- **When** were you working on the program (dates: month, year)?
- **Which specific program** were you involved with (spray seal, de-seal reseal etc)
- What were your **duties**? (supervision/organisation only or any direct contact)?
- What was the **level** of supervision you provided, saw being provided by others?
- Did this **vary** at all? If yes, with regard to what?
- Can you take me through a **typical day** on the program?
- **Where** were you working? (rag hangar, boiler room etc)
- For **how long** (per day plus overall in terms of days/weeks/months)?
- **People working directly alongside you** (working independently/or in teams)?
- With **what staff**, on **what tasks** (support crew tank crew etc ) did you work?
- What **contact** did these others have with you and the tanks?
- Did the intensity and pace of your work change at any time during your involvement (When, why did this happen)?
- Did this **alter the way duties were carried out** (mixing and disposal procedures, PPE, clean up etc)
- If **extra workers** were brought in who were these people (muster, section they came from)?

### Further definition of work place practices, equipment used, (non) adherence to safety procedures, occupational history before/after deseal operations?

- Were there any **official safety procedures in place**? (PPE which types, what was actually used,
- What **protective measures** did you see employed (clothing, equipment and work practices)?
- Were these **suitable for the tasks undertaken** in your opinion (access, difficulties, worker attitudes to use)?

- **Physical set up** of shop floor, can you describe the working environment for me?
- Windows and ventilation, drainage, air **conditions generally**
- Other **pollutants** present?
- **Chain of command**, what **working relationships** did you have with the other workers on the program?
- How did you feel about **your involvement** in management/supervision of the program?
- About **the program overall**?

### **Awareness and perceptions of problems and sense of risk**

- Did the people you worked with or supervised report any health problems to you?
- Would there have been any **reason for people not to report** such problems at the time?
- **Have they since** reported any past or current health problems to you? (symptoms, experiences)
- Were these problems linked to the program(s) and work undertaken there? (How)
- Are you/were you aware of any risks/dangers linked to the deseal/seal program and the chemicals used?
- Do you know/did you know what the chemicals being used were? (chemical make-up)?
- Did you advise workers of this? (how did workers respond)
- Were any dangers/risks highlighted to you or information made available to you while working on the program? More recently?
- If yes, can you please describe these risks (severity, risky for which work groups)

IS THERE ANYTHING ELSE YOU WOULD LIKE TO MENTION THAT YOU THINK IS IMPORTANT AND THAT WE HAVE OVERLOOKED?

## Appendix D : Theme list for semi-structured interviews - Other personnel

### Level of Exposure, spatial geography of workers and production requirements

- **When** were you working on the program (dates: month, year)?
- **Which specific program** were you involved with (spray seal, de-seal reseal etc)
- What were your **duties**? (which area/s of planes, work tasks)?
- What **supervision**, if any, did you experience?
- Did this **vary** at all? If yes, with regard to what?
- Can you take me through a **typical day** on the program?
- **Where** were you working? (rag hangar, boiler room etc)
- For **how long** (per day plus overall in terms of days/weeks/months)?
- **People working directly alongside you** (working independently/or in teams)?
- With **what staff**, on **what tasks** (support crew tank crew etc) did you work?
- What **contact** did these others have with you and the tanks?
- Did the **intensity and pace** of your work change at any time during your involvement (When, why did this happen)?
- Did this **alter the way duties were carried out** (mixing and disposal procedures, PPE, clean up etc)
- If **extra workers** were brought in who were these people (muster, section they came from)?

### Further definition of work place practices, equipment used, (non) adherence to safety procedures, occupational history before/after deseal operations?

- Were there any **official safety procedures** in place? (PPE which types, what was actually used clothing equipment work practices)
- Were these actually adhered to
- Were these **suitable for the job** in your opinion (access, difficulties, worker attitudes to use)?
- Can you describe the **working environment** for me?

- Windows and ventilation, drainage, air, **conditions generally**
- Other **pollutants** present?
- What **working relationships** did you have with the other workers on the program?

### **Awareness and perceptions of problems and sense of risk**

- Did you experience **any health problems** while you were working on the program? (what were the symptoms, did you report them, how linked to program work)
- Have you experienced **any health problems since** then that you think are a result of your work on the program? (symptoms, experiences, how linked to program work)
- Are you/were you aware of **any risks/dangers** linked to the deseal/seal program and the chemicals used? (were you warned of these or given information at the time, more recently)
- Can you **describe these risks**
- Do you know/did you know what **the chemicals** being used were? (chemical make-up)?
- How did you feel about **your involvement** in the program?
- About **the program overall**?

IS THERE ANYTHING ELSE YOU WOULD LIKE TO MENTION THAT YOU THINK IS IMPORTANT AND THAT WE HAVE OVERLOOKED?

## Appendix E : Rationale for alterations for qualitative interviewing schedule

Two broad changes have been made to our interview procedures based on the data gathered during the pilot phase of the project. We have developed separate interview schedules for ‘supervisory and key organisational personnel’<sup>7</sup>, and for ‘other personnel’<sup>8</sup>, and also a one page short survey for ‘other personnel’. The rationale for the changes in both cases is that the depth and quality of data gathered during the next round of interviews can be improved by specialising our data gathering techniques to tap the different perspectives these two groups can provide us with. Each of these changes are discussed below.

The first procedural alteration proposed, the use of two separate interview schedules for ‘supervisory and key organisational figures’ and ‘other personnel’ was indicated by initial analysis of the pilot data. In these interviews, researchers had occasion to speak to people hailing from both of these categories. On reflection, it became clear that certain lines of inquiry could be more appropriately pursued with personnel involved in the various programs in a supervisory or organisational capacity, than with general personnel. To give an example, it is far more feasible that supervisors and higher ranking personnel are in a position to comment on the general level of provision of PPE across their involvement with a program, and if any changes occurred over time, than is a worker who was involved with a single aspect of that program for a short period of time only. By the same token, it is also more likely that workers directly involved in maintenance will be able to report on their own experiences of health effects, attributable to involvement with a program. This is not to say that particular issues will not be raised with each personnel group, but rather that the two schedules will have different emphases. It was felt that by tailoring the different schedules to the information and experiences that each group were most likely to be able to report on, the information gathered on key issues could be maximised.

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<sup>7</sup> This category includes staff who worked with the board of enquiry, but who lacked direct personal experience with the F-111 programs, as well as personnel who may have been engaged in supervising work on the programs, rather than having had direct personal involvement in this work.

<sup>8</sup> This category includes any other personnel, most of whom will have had direct personal involvement in work on a F-111 maintenance program.

Additionally we have introduced a one page short survey aimed at determining prior and current work histories of workers, which includes questions on any previous or current exposures to chemicals and any previous or current health problems. If exposure related to the F-111 programs is to be isolated, we need to be able to discount other sources of occupational hazard. The short survey format was adopted as this information is largely factual in nature and it was felt that interview time could be best devoted to exploring more experiential issues. The survey can be filled out very quickly and can be given to participants to fill out while the interviewer is setting up equipment etc.

## Appendix F : Brief work history sheet for interview participants

What is your current occupation? \_\_\_\_\_

How long have you had this job? \_\_\_\_\_

What positions/musters did you have during your time in the RAAF?

1 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

2 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

3 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

What other occupations have you had between leaving high school and joining the RAAF?

1 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

2 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

3 \_\_\_\_\_ Length of time in this position \_\_\_\_\_

During your working life, have any of these other occupations involved working with chemical substances?

*(please circle an answer)*

1 Yes

2 No

If YES, can you please give a brief description of the work and list any chemicals you can remember using?

*(please use the back of this page if you need more space for your answer)*

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Have you ever had any health problems at all, that you think was linked to a job you have had, apart from any of the F-111 maintenance programs?

1 Yes

2 No

If YES, can you please briefly describe these for us

*(please use the back of this page if you need more space for your answer)*

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# **Appendix G : General Information and Risk Management Manual**

See attached document.

# **Study of Health Outcomes in Aircraft Maintenance Personnel**

A collaborative study conducted by researchers from the Hunter Medical Research Institute and The University of Newcastle Research Associates (TUNRA Ltd), administered by the Department of Veterans' Affairs on behalf of the Department of Defence.

## **Qualitative Interview General Information and Risk Management Manual**

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## NAMES AND CONTACT NUMBERS

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Below are the names of people who are available to be contacted regarding the Study of Health Outcomes -

### Study Investigator

#### **Dr Catherine D'Este**

Centre for Clinical Epidemiology and  
Biostatistics, DMB,  
The University of Newcastle  
Newcastle NSW 2300  
Phone 02 49236147  
Fax 02 49236148 Fax 02 49236148

### Project Manager

#### **Meredith Tavener**

Centre for Clinical Epidemiology and  
Biostatistics, DMB  
The University of Newcastle  
Newcastle NSW 2300  
Phone 02 49236200  
Mobile 0421 736 888  
Email [mtavener@cceb.newcastle.edu.au](mailto:mtavener@cceb.newcastle.edu.au)

### DVA Contact

#### **Tim Beard**

Assistant Director  
Research Studies Support  
Defence Links Branch  
DVA National Office  
Woden ACT 2606  
Phone 02 62896460  
Fax 02 62896173

### Airman's Advocate

#### **Warrant Officer "Blu" Hind**

Amberley RAAF Base  
Free call number 1800 558 022  
Fax 02 54614514  
Email [F111Advocate@drnex.defence.gov.au](mailto:F111Advocate@drnex.defence.gov.au)

### Independent Contact Person NSW

#### **Susan O'Connor**

Human Research Ethics Officer  
Research Branch  
The Chancellery  
The University of Newcastle NSW 2308  
Phone 02 49 216333

### Independent Contact Person ACT

#### **Raphaela Jarvis**

Assistant Executive Secretary  
Australian Defence Human Research Ethics  
Committee  
CP2-7-66  
Department of Defence  
Canberra ACT 2600  
Telephone: (02) 6266 3837  
Fax: (02) 62664982  
E-mail [ADHREC@defence.gov.au](mailto:ADHREC@defence.gov.au)

# THE HEALTH OUTCOMES STUDY

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## Introduction

The “Study of Health Outcomes in Aircraft Maintenance Personnel” was commissioned by the Department of Defence. It followed recommendations by the (then) Chief of Air Force, that an epidemiological study be conducted into the symptoms described by personnel involved in the F-111 deseal/reseal programs compared with a group of similar workers not exposed to chemicals in the fuel tank repair program(s). The Study is being run collaboratively by a number of different researchers from the Hunter Medical Research Institute, represented by The University of Newcastle Research Associates (TUNRA Ltd). Members of the Study team have expertise in the fields of occupational health and safety, epidemiology, medical statistics, and assessment of environmental exposure.

## Description of the Health Outcomes Study

The broad aim of the Health Study is to answer the question – Is there an association between adverse health status and F-111 deseal/reseal maintenance activities? And if so, what is the nature and strength of those associations?

In order to answer this question, the Health Outcomes Study will involve a comprehensive investigation into the health of F-111 deseal/reseal personnel. All RAAF and civilian personnel who were involved in any of the F-111 fuel tank repair programs are strongly urged to register for the Study, which will be conducted over a 3 year period. There are three main phases to the Study –

1. Phase 1 involves reviewing the current literature on occupational medicine, potential effects of different chemical agents, genetic epidemiology and general environmental health; developing a definition of who was “exposed” to potentially damaging agents versus the types of workers who can take part in the “comparison” group; and the conduct of a small number of face-to-face interviews with personnel who carried out different activities as part of the F-111 deseal/reseal process to hear about their involvement, if their work caused them to feel unwell and how they feel about the deseal/reseal program now.

2. Phase 2 involves a comparison of the health of “exposed” personnel with a group of comparison workers who weren’t involved in the same type of work, yet have other similar characteristics such as rank, mustering, also perform aircraft maintenance work and are the same age and gender. This comparison is done by the Australian Institute of Health and Welfare, and uses de-identified data only. This means that Health Study participants do not have to be interviewed in person, or take part in any health tests. All the data are completely anonymous and do not contain any names or addresses. This type of comparison between “exposed” and “comparison” personnel can provide valuable information as to whether F-111 deseal/reseal workers have suffered a greater number of serious health problems relative to other people who performed similar work, but were not involved in deseal/reseal.
  
3. Finally, Phase 3 represents the General Health and Medical Study. This Phase involves extensive medical assessments for participants in both the “exposed” and “comparison” groups. Initially a telephone interview using a health questionnaire will be completed. Also, each person who gives their consent to take part in the Health Outcomes Study will receive a full medical examination by specially trained Medical Practitioners from Health Services Australia (who have offices in each State, and are specialists in collaborative studies such as this). As part of the assessment there will be reflex testing, mood and personality tests, a skin examination, questions on smoking and alcohol intake, reproductive history, tests for liver and immunological function, markers of genetic damage as well as general health indices such as blood pressure and cholesterol. Also, a very significant aspect of the General Health and Medical Study is the study of birth defects and cancer in children.

# QUALITATIVE INTERVIEWS

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## Introduction

Also described as “qualitative interviews”, these face-to-face discussions are essential elements of the Health Outcomes Study. The aim of the Interviews is to obtain a clear description of the activities involved in each of the F-111 deseal/reseal programs, from a different perspective such as workers, field manager and supervisors, as well as medical and occupational health and safety officers. Information will include who was involved in which program(s), the protective equipment used, the physical set up, spatial geography, and demarcation of roles of those involved. Each person will also be asked questions about their perceived current and future health problems.

It is essential that the Study team be able to define the term “exposed” at the start of the project. This definition will determine who is eligible to take part in later phases of the Study, where the health of RAAF personnel involved in the F-111 deseal/reseal program(s) is compared with others who were not involved. Only through discussions with people who were involved either directly with the F-111 program or worked nearby, can we start to gain a better understanding of the problems encountered by workers, and conduct our Study accordingly.

## How F-111 deseal/reseal workers were identified

DVA already held some data on involved workers as part of the Board of Inquiry (BOI), including witness statements and interviews with participants. A database was developed to include Defence personnel and contracted civilian workers who were not nominated as part of the BOI, but were still involved in F-111 deseal/reseal activities, perhaps in charge of duties conducted outside of the fuel tank, supervising other workers, or mixing or assisting with disposal of chemicals. The database currently holds approximately 1100 names of individuals who called up about their own involvement, or been nominated by others who knew them, and were involved in any type of F-111 deseal/reseal work during the period from 1977 to 2000.

## What each Interview will involve

Each Interview will be conducted by a specially trained Health Social Scientist, using a series of prompts. There will be a number of structured questions so that we can firstly gain an understanding of the types of work a person was required to carry out, and the types of equipment they used. Some information regarding the types of work carried out before and after the F-111 deseal/reseal programs would also be helpful, in terms of the other types of other exposures encountered as part of general work duties.

A significant feature of the Personal Interviews is the opportunity for each person to “have their say” about their involvement in the deseal/reseal programs. If there are any particular issues an interviewee would like to raise regarding the F-111 deseal/reseal work practices, safety concerns and health conditions, there will be the opportunity to do so during the Interview. Each person should allow approximately two hours for their Interview. Breaks from discussion can be taken at any time, and each person has the right to terminate their Interview at any stage.

## THE ROLES AND RIGHTS OF PARTICIPANTS/OTHERS IN THE STUDY

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There are a number of separate bodies that must be taken into consideration when discussing the roles and rights of others. These include:

- Consenting volunteers participating in the Study (and their carers)
- The Department of Defence
- The Department of Veterans' Affairs
- The Central Coordinating Committee for the Health Outcomes Study and project staff

### Participants

Participants in the Health Outcomes Study have the right and responsibility to be fully informed and make choices about their participation, as well as their own health care and lifestyle. Law protects some of these rights, while others are recognised as basic human rights. The Central Coordinating Committee for the Health Outcomes Study recognises the participant's rights and requires that all personnel involved with the Study be committed to the goals and concepts of these rights.

### Participants have the right to

- Change or cancel their appointments by contacting the Project Manager for the Study, or any other person nominated as a point of contact for participants
- Nominate a friend, family member or representative to be present during their Interview
- Ask for details of identity, professional status and qualification of the Interviewer visiting them as part of the Study
- Have their Personal Interview conducted with due consideration and respect, without bias or discrimination regardless of age, social status, sex, race, religion, political belief, medical condition or sexual preference
- Choose not to respond to any questions asked as part of their Personal Interview
- Listen to their taped discussions in full, and edit or erase any part about which they feel uncomfortable.

Participants may contact an independent person for further advice regarding concerns about the Health Outcomes Study. Contact numbers for Sue O'Connor (The University of Newcastle Ethics Committee) and Raphaela Jarvis (Defence Force Ethics Committee) are given in the front of this Manual, as well as on the participant Information Statement and reminder cards. Alternatively, participants can call a member of the Defence Force who has knowledge and understanding of the issues involved in the F-111 deseal/reseal programs, "airman's advocate" Blu Hind on 1800 558 022.

It is also the right of the Study participant to seek legal advice if they consider harm has occurred as a result of negligence by the Interviewer. They also have the right to withdraw their consent to participate at any time during the course of the Study. It is important to note that some participants may be considering their own options in terms of legal action in response to health problems suffered from their F-111 deseal/reseal involvement. Whether a person chooses to discuss their actions in this respect is their decision, it is not a matter of discussion to be raised by the Interviewer. Nor is it inconceivable that Interview material be sought out and used as part of legal action.

### Carers

A carer may play an important role in the life of a participant who suffers ill health, and should be duly acknowledged. Contact with carers may occur if -

1. A person consents to participate in the Study and the carer then contacts us on their behalf to find out more information
2. A participant specifically requests the presence of their carer during the Interview
3. The carer for some reason needs to be contacted, ie; in an emergency situation.

Confidentiality between the Interviewer and the participant is important and cannot be breached unless the participant gives exact permission to the contrary. A carer may request a written or verbal report of the Personal Interview but should tactfully be advised of the responsibility of the Interviewer and his/her inability to breach confidentiality without the participant's consent. The carer is free however; to ask the participant for a copy or permission to read the summary.

## Project Manager

The Project Manager is responsible for the day-to-day management of the Health Outcomes Study, under the regulation of the Central Coordinating Committee. This role includes regular liaison with members of the research team, representatives from Defence and DVA, and other Study stakeholders, production of progress reports as required, monitoring of mail-out progress, questionnaire development, promotion of accurate and reliable data collection, database operation, and institution of quality monitoring procedures.

## Central Coordinating Committee

The Committee is responsible for overseeing day-to-day management of the Health Outcomes Study, under the auspices of the Scientific Advisory Committee and the Consultative Forum. From the Project Manager the Committee regularly receives updates of all Project progress, are provided with drafts of project reports and documentation for review, and responds to needs and events as they emerge during the course of the Study.

## Department of Defence and Department of Veterans' Affairs

The Health Outcomes Study is administered by the Department of Veterans' Affairs on behalf of the Department of Defence. Representatives from both Departments receive regular reports of Study progress through the Scientific Advisory Committee and Consultative Forum.

## Other Services

Individuals who choose to take part in a Personal Interview may be receiving care and attention from other services apart from those provided by DVA and/or the Department of Defence, and it is important that the roles of other services be respected and not undermined.

## QUALITY MONITORING WITHIN THE HEALTH OUTCOMES STUDY

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Quality assurance procedures are important for the optimal conduct of the Health Outcomes Study. The goal of quality assurance within the overall Study is to develop monitoring systems and measures which ensure consistency of data collection, facilitate prompt follow up and resolution of problems and assist with evaluation of the Study data.

In terms of the Personal Interviews, quality monitoring by the Project Manager will facilitate a temperate approach to the recruitment of Interviewees, ensure regular feedback on the conduct of each Interview, the performance of proposed Interview themes and prompts and the satisfaction of participants.

There are many methodologies to assess and enhance the delivery of quality services. The following will be established prior to the commencement of home visits.

### Structure

The Department of Veterans' Affairs and researchers from the Hunter Medical Research Institute (as represented by TUNRA Ltd) will sign a Contract outlining the terms and conditions for the conduct of Phase 1 of the Study.

A confidentiality statement will be signed by each Interviewer prior to the conduct of any interviews. A pre-brief will be provided to each Interviewer, together with a General Information and Risk Management Manual. Contact numbers of Study stakeholders will be provided to each Interviewer as part of their Manual, to facilitate discussion before, during and after the Interviews. Following the conduct of four purposefully selected Interviews, the Manual will be updated if protocols are modified or new protocols established.

Each Interviewer will be issued with a University of Newcastle photo ID badge, that must be worn at all times while conducting Personal Interviews.

## Process Measurement

1. Discussion of the aims and objectives of the Personal Interviews as a basis for establishing the direction of questioning to be taken during each Interview,
2. The conduct of each Interview will be based on feedback from previous performance of initial Interview themes and prompts,
2. De-briefing and sharing of information between the two Interviewers, and between Interviewers and the Project Manager, to ensure compliance with changes to Interview themes,

## Outcomes

Outcomes will include a final definition of “exposed” versus “comparison” workers, to be used as part of the General Health and Medical Study (Phase 3).

## Reporting

Each Interviewer will be responsible for liaising with the Project Manager prior to the conduct of any Interviews to make sure of the number of Interviews to be conducted and the type of data to be collected during each. Liaison should also occur in-between Interviews, should the need arise to discuss Interview arrangements, questions regarding the Health Outcomes Study in general, or the occurrence of an accident or incident by an Interviewee or Interviewer. A final de-brief by the Interviewers at the completion of all purposeful and randomly selected Interviews shall take place with members of the Central Coordinating Committee. An interim report on the types of work activities that led individuals to be put at risk will be submitted to the Committee prior to the final report on the qualitative study, to allow the definition of “exposed” versus “comparison” groups.

## Procedures for the conduct of qualitative interviews

### PURPOSEFULLY SELECTED PARTICIPANTS

AIM –

To conduct a small number of interviews with individuals known to have been involved in F-111 deseal/reseal activities, to trial proposed interview themes and collate fruitful data prior to the conduct of interviews with randomly selected personnel.

## PROCEDURE –

DVA provides the research team with the names and phone numbers of three specially chosen contact people. A fourth contact person was nominated by the Project Manager. All details were forwarded to the lead Interviewer from the research team, who contacted each in turn to introduce the Study and to invite each to take part in a face-to-face interview to discuss their deseal/reseal involvement.

The four purposefully selected interviewees will be visited on one day only. Two Interviewers from the research team will travel together, but will conduct interviews separately, each Interviewer seeing two participants. Each Interviewer will be provided with a copy of the General Information and Risk Management Manual, together with copies of the proposed Interview themes and prompts and contact numbers for further information or counselling advice.

Prior the start of interviewing, each participant will be provided with an opportunity to read through the Information Statement and asked to sign the Consent Form if they are happy to continue with the Interview. Members of the Defence Force will also be provided with a copy of the “Guidelines for Volunteers” (not necessary for civilian interviewees). Make each participant aware of the time usually required for an Interview, and reinforce that they can take a break or terminate the Interview at any time.

Once all documents are signed, each participant should be asked if they consent to having their discussions tape-recorded, simply for the purposes of accuracy in transcribing. If the person consents, the tape-recording equipment may be set up. If they do not consent, continue the Interview as planned, but take hand notes as an alternative. It is important to reassure all participants that no information transcribed from their discussions will permit any individual to be identified. Tape recordings will be kept for the term of the Study and then cleaned of all information. Please note, it is also the right of the participant to listen to their taped discussions in full, and edit or erase any part about which they feel uncomfortable.

Interviewers should make note of Defence-specific terminology used by a participant, to further enhance subsequent interviews. Information provided by the Project Manager prior to the conduct of Interviews should also be reviewed, in order to improve the Interviewer’s familiarity with Defence expressions, Squadron and Wing names, mustering terms and levels of rank.

At the completion of all questioning, ensure that the participant is not suffering any ill effects from the Interview process (ie: upset, over-tired, anxious). Offer further numbers for counselling if necessary, and spend adequate time with the person to allow them to finish expressing any remaining thoughts about their F-111 involvement, and to ask questions they may have about the Health Outcomes Study.

A letter will be sent to each participant thanking them for their involvement by the Project Manager, once all Interviews have been completed and all data transcribed.

## RANDOMLY SELECTED PARTICIPANTS

### AIM –

To conduct personal interviews with a group of consenting individuals who were selected at random from the different F-111 deseal/reseal program types, to gather data to assist the final definition of “exposed” and “comparison” cohorts.

### PROCEDURE -

Contact details for involved personnel from any of the F-111 deseal/reseal programs are maintained in one database by DVA. A de-identified version of the database was forwarded to the Project Manager to allow the selection of potential participants by the random identification of record numbers.

A total of 22 randomly selected individuals were identified, and a description of selection criteria forwarded to DVA to be matched with their own database. Each person receives a package by post, which contains an invitation to take part in a Personal Interview, an Information Statement about the Health Outcome Study and a Consent Form (members of the Defence Force will also be provided with a copy of the “Guidelines for Volunteers”). To take part in an Interview, each person must sign and return the Consent Form to the research team.

Following the implementation of two reminder card mail-outs, all consenting individuals will be contacted to arrange their interview. Due to the number of interviews to be conducted, two Interviewers from the research team will visit participants over the period of approximately 10 days. Each Interviewer will be provided with a copy of the General Information and Risk Management Manual, together with copies of the proposed Interview themes and prompts and contact numbers for further information or counselling advice.

Prior to the start of questioning, each participant should be asked if they consent to having their discussions tape-recorded, simply for the purposes of accuracy in transcribing. If the person consents, the tape-recording equipment may be set up. If they do not consent, continue the Interview as planned, but take hand notes as an alternative. It is important to reassure all participants that no information transcribed from their discussions will permit any individual to be identified. Tape recordings will be kept for the term of the Study and then cleaned of all information. Please note, it is also the right of the participant to listen to their taped discussions in full, and edit or erase any part about which they feel uncomfortable.

At the completion of all questioning, ensure that the participant is not suffering any ill effects from the Interview process (ie: upset, over-tired, anxious). Offer further numbers for counselling if necessary, and spend adequate time with the person to allow them to finish expressing any remaining thoughts about their F-111 involvement, and to ask questions they may have about the Health Outcomes Study. A letter will be sent to each participant thanking them for their involvement by the Project Manager, once all Interviews have been completed.

Each Interviewer should remember not to attempt too many Interviews in any one day. Apart from the time demands of travel and preparation, it is also extremely important to recognise the quantity and nature of information you will be receiving during an Interview, and to plan personal time between Interviews to reflect and recover. It is important that both Interviewers provide support for one another during the Interview period, and discuss any difficulties that may have occurred. In addition, during the Interview period specific times will be allocated for liaison with the Project Manager, to discuss progress and the types of issues being discussed by participants. If an Interviewer feels that they will need some time away from work on their return, or that they would like to speak to a counsellor themselves about the types of information received during the Interviews, the Project Manager can make all the necessary arrangements for this to occur.

Both Interviewers will be required to meet with members of the research team on their return to discuss the Interviews, and the types of information received towards defining the “exposed” and “comparison” cohorts. Following transcription of the Interviews, a second meeting will be conducted with interim findings for the definition of cohorts discussed in greater depth.

# EMERGENCIES

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## Dealing with Emergencies and Difficulties

There is always a chance that interviewers may be present during a medical emergency involving a participant, or that there is a need to contact services such as Police or Ambulance. Whatever the situation, a common-sense approach is essential.

Interviewers are not to use their own car, or a Hire car, or taxi to escort interviewees who may be in need of medical assistance. Using a mobile phone or the landline at the interviewee's own home, call an Ambulance if emergency transport is needed. The Ambulance service is available at all times and are able to assist in a wide range of situations - call 000 and ensure you know where you are and give the closest cross street if possible.

### **Administering First Aid**

It is not expected that an Interviewer administer first aid to an interviewee in need of medical assistance. Assess the situation and use precautionary action as appropriate –

- Keep the person (and any one else present) as calm as possible
- Make person as comfortable as possible (but do not move them) until the Ambulance or Local Medical Officer arrives and makes an assessment

If the person has chest pain only, sitting them up may assist until help arrives.

### **Emergencies could include**

- Cardiac arrest
- Stroke
- Participant unable to move from the floor, toilet or elsewhere due to fall, accident, injury etc
- Participant unusually short of breath and/or complaining of chest pain
- Seizure

### **Criminal Acts or threats of violence**

- Cease all questioning as part of the Personal Interview
- Try to calm the person down
- Do not remain in a threatening environment
- If necessary, report to local Police
- Report to Project Manager

### **Deceased Person**

- Do not move or touch the body, as there may be a Coroner's Inquest
- Notify the Police and Ambulance – dial 000
- Remain with the body until the Police arrive and cooperate with enquires
- Report to the Project Manager, who may be required to report the incident to The University of Newcastle

### **Confused participants, or participants suspected as confused**

- Clearly explain who you are, make sure you are wearing your ID badge
- Answer any questions the interviewee asks clearly and simply
- Try to find out if the person knows why you are visiting with them, and do not proceed with the Personal Interview if you feel the person does not clearly understand your purpose
- Ask if there is anyone you could call on their behalf, or check with a neighbour

### **Threats or concerns about suicide or other mental health problems**

- Do not remain in a threatening environment
- Ask if there is anyone you could call on their behalf
- May require immediate intervention by Ambulance service
- Do not dismiss participants feelings about his/her distress - keep lines of communication open
- Try to identify if the person is taking medications or receiving treatment
- You may contact Lifeline or VAN (Veterans' Affairs Network) for counselling services

### **After the Event**

- Complete a University of Newcastle Incident Report form
- You may wish to seek debriefing for yourself from a counsellor recommended by your employing agency or other preferred counsellor

## ETHICAL AND LEGAL ISSUES

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### Summary of Ethical Considerations

The Study of Health Outcomes in Aircraft Maintenance Personnel has been designed in accordance with the Information Privacy Principles and NHMRC Guidelines for Protection of Privacy in the Conduct of Medical Research, regarding the use of routinely collected data and the solicitation of personal information from study participants. The Study will comply with the International Ethical Guidelines for Biomedical Research Involving Human Subjects. The three major ethical considerations include use of routinely collected data, solicitation of personal information and participant care.

For the Qualitative Study potential participants will be asked to provide written informed consent prior to their interview. The information package initially provided to potential participants included:

1. Letter of invitation to take part in a Personal Interview, signed by the Chief of Air Force,
2. An Information Statement about the Study and the Personal Interviews, including a statement regarding each person's participation being voluntary, and that refusal to participate will in no way affect their career or entitlements,
3. A Consent Form, which each person needs to sign, date and return in order to have their Personal Interview arranged for them.

All documentation details the proposed length of their Personal Interview (including a statement that participants have the right to withdraw at any time, and to review and erase part or all of their interview transcript), and includes reassurance that all information will remain strictly confidential, and will be destroyed at the completion of the Study.

There are a small number of purposefully selected participants who will be approached directly by the Interviewer. Consent to take part in a Personal Interview by these volunteers will be provided initially over the telephone to a member of the research team. Follow up with a postal return Consent Form will occur within a week of telephone contact.

Both Australian Defence Force members and civilians participating on any level in a Personal Interview must be treated with consideration and respect. The following points should be kept in mind by each Interviewer working on the Health Outcomes Study –

- Respect each persons' individual needs, values and culture
- Respect the rights of persons to make informed choices in relation to taking part in further aspects of the Health Outcomes Study
- Hold in confidence any information obtained in a professional capacity, and use professional judgement in sharing such information
- Respect the accountability and responsibility inherent in the role of Interviewer

### Proposed storage, access and disposal of files

All identifiable participant interview information will be stored in locked filing cabinets in the office of the Project Manager. Data stored on computer will be accessible only by a password known to the Project Manager and principal investigators. Data will be coded for computer entry and all identifiable participant interview information destroyed at the completion of the Study. All data published will be anonymous group data and summary statistics, with no individual participant able to be identified.

### Legal Issues

Interviewers employed to work professionally on the Health Outcomes Study are to abide by the laws of Australia including the laws of their individual state as well as professional registration acts, civil laws, and criminal law.

Each Interviewer working on the Study is responsible for all their actions and as such should be aware of the principles of law that govern their actions within society. Please refer to The University of Newcastle (or your professional association) if you are unsure of your legal rights and responsibilities.

# OCCUPATION HEALTH AND SAFETY ISSUES

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## General Safety Precautions

1. If you use your own car at any stage during the Interview process, ensure your car is locked and parked securely. Keep your keys handy.
2. Do not leave any valuables, drugs, bags or mobile phones in the car especially when they are clearly visible to passers-by.
3. Ensure you are wearing personal identification badge from The University of Newcastle.
4. For your personal safety ensure you inform the Project Manager of the number of interviews scheduled for each day and their location.
5. Leave your mobile phone number with the Project Manager, and make sure you have contact details for members of the research team (for daytime and after hours).
6. Do not place yourself at risk for the sake of completing an Interview.

**Look after Yourself -  
Your safety is important!**

## General Safety Precautions when visiting a home

1. Ensure you have a map and correct address and request any specific directions by phone prior to visit (ie.. nearest cross-road or is there a street number on the house or some other means of identifying the participant's home).
2. Define and ensure there is access to the participant's home (ie. through gates, doors etc).
3. Prior to your visit request participant or carer have dogs securely restrained away from the entrance to the home.
4. Establish your credentials and ensure person will consent to you entering their home.
5. Be observant and cautious and be prepared to leave quickly if the need arises.
6. At the completion of the final Interview, ensure you let the Project Manager know that you are returning.

No home appointment should be attended by an Interviewer who is alone when

- Known domestic violence has occurred and perpetrator is at home/likely to return
- There is a known risk of injury occurring to the participant or interviewer
- The interviewer feels unsafe or at risk

If, on arrival at a participant's home, you are suspicious or threatened, take the following action

- If in a car, ensure windows are closed and doors locked
- If arriving in a taxi, request that they wait until you are comfortable about entering the house, then they can leave
- Contact police and /or workplace if appropriate
- Go to a neighbouring house and call a taxi to leave the area (or use mobile phone)

Aggressive Situations

- If concerned about a possible dangerous situation, get out and summon for help
- Remain calm and in control
- Use your communication skills to try to talk your way out of the situation
- Call for assistance and protect yourself