NSW GOVERNMENT | Chief Scientist & Engineer

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Committee Secretariat
Foreign Affairs, Defence and Trade Committee
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600
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Dear Secretariat

Questions on Notice: Public Hearing, Thursday 3 December 2015

I write to provide additional information to the Standing Committee's inquiry into *Contamination of Australia's Defence Force facilities and other Commonwealth, state and territory sites in Australia.*

As Chair of the NSW Government's Williamtown Contamination Expert Panel, I gave evidence to the Committee on 3 December 2015. During that public hearing I took questions on notice about blood testing for Perfluorinated Chemicals.

In a subsequent letter to the Committee (17 December 2015), I advised the issue of blood was the subject to significant debate at the enHealth Committee meeting on 11 December 2015, and that it would be subject to further refinement by the Australian Health Protection Principal Committee. In that correspondence I committed to forwarding relevant information to the Committee once a final decision had been reached.

Please be advised that in March enHealth released its Guidance Statement on Perfluorinated Chemicals addressing blood testing. The statement states in part that:

> *"A blood test can measure the level of PFOS and PFOA in a person's blood and can tell a person concerned about exposure to PFCs how their blood PFOS and PFOA levels compare with the levels seen in the general Australian population. However, these tests are not routine and there is at present insufficient scientific evidence for a medical practitioner to be able to tell a person whether their blood level will make them sick now or later in life, or if any current health problems are related to the PFC levels found in their blood.*
>
> *As such, blood tests have no diagnostic or prognostic value and are not recommended for the purpose of determining whether an individual's medical condition is attributable to exposure to PFOS or PFOA.*
>
> *In the absence of any test, including a blood test, being definitive in informing individual risk and clinical management, exposure reduction is the key measure to reduce any possible risks posed by PFCs.*

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At a population level, blood tests can inform a community that they have been exposed to PFCs at a level above that of the general population. The monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures."

I have enclosed a copy of the full guidance statement for your information. I will forward any other information relevant to the Questions on Notice as required.

Yours sincerely

Mary O'Kane
NSW Chief Scientist & Engineer

enHEALTH
Environmental Health Standing Committee (enHealth) of the
Australian Health Protection Principal Committee

enHealth Guidance Statements on Perfluorinated Chemicals

Background and context:

Perfluorinated chemicals (PFCs) are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease and water. Products that may contain PFCs include furniture and carpets treated for stain resistance, foams used for firefighting, fast food or packaged food containers, make up and personal care products and cleaning products. Other chemicals used in these applications may be precursors to PFCs, and the PFCs are formed when these chemicals are released into the environment.

PFCs are of concern around the world because they are not broken down in the environment and so can persist for a long time. Their widespread use and persistence means that many PFCs are ubiquitous global contaminants.

The PFCs of most concern are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Many countries have phased out, or are in the process of phasing out the use of PFOS and PFOA due to concerns about their persistence, bioaccumulation and toxicity.

Because of their widespread use, most people in Australia will have some PFOS and PFOA in their body. PFOS and PFOA are readily absorbed through the gut, and once these chemicals are in a person's body it takes about two to nine years, depending on the study, before those levels go down by half, even if no more is taken in.

The Australian Government has been working since 2002 to reduce the importation of some PFCs. In Australia and internationally where the use of PFCs has become restricted a general trend towards lower PFCs levels in a person's body has been observed.

Outside of the occupational setting, exposure to PFCs can occur from the air, indoor dust, food, water and various consumer products. For most people food is expected to be the primary source of exposure to PFOS and PFOA. Human breast milk may contribute to exposure in infants since PFCs have been detected in human breast milk.

For some communities near facilities where PFOS and PFOA have been extensively used, higher levels may be found in the surrounding environment and exposure may occur through other means, including drinking water supplied from groundwater.

In chronic exposure studies on laboratory animals, research into PFOS and PFOA has shown adverse effects on the liver, gastrointestinal tract and thyroid hormones. However, the applicability of these studies to humans is not well established.

In humans, research has not conclusively demonstrated that PFCs are related to specific illnesses, even under conditions of occupational exposure. Recent studies have found possible associations to some health problems, although more research is required before definitive statements can be made on causality or risk.

Because the human body is slow to rid itself of PFOS and PFOA, continued exposure to these chemicals can result in accumulation in the body. Due to the potential for accumulation, and while uncertainty around their potential to cause human adverse health effects remains, it is prudent to reduce exposure to PFCs as far as is practicable. This means that action needs to be taken to address the exposure source or possible routes of exposure. Determination of exposure is best achieved through a full human health risk assessment that examines all routes of exposure.

It is understandable that communities living in PFC affected areas may want to know what their level of exposure to PFCs is and what this means for their health and the health of their families. The lack of certainty around the potential for health effects can compound concerns.

A blood test can measure the level of PFOS and PFOA in a person's blood and can tell a person concerned about exposure to PFCs how their blood PFOS and PFOA levels compare with the levels seen in the general Australian population. However, these tests are not routine and there is at present insufficient scientific evidence for a medical practitioner to be able to tell a person whether their blood level will make them sick now or later in life, or if any current health problems are related to the PFC levels found in their blood.

As such, blood tests have no diagnostic or prognostic value and are not recommended for the purpose of determining whether an individual's medical condition is attributable to exposure to PFOS or PFOA.

In the absence of any test, including a blood test, being definitive in informing individual risk and clinical management, exposure reduction is the key measure to reduce any possible risks posed by PFCs.

At a population level, blood tests can inform a community that they have been exposed to PFCs at a level above that of the general population. The monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures.

Recognising the difficulty in assessing and communicating the risks posed by PFCs to the community, enHealth has developed these guidance statements on key health issues to support jurisdictional responses to incidents of environmental PFC contamination.

Guidance statements:

1. Health impacts from exposure to PFOS and PFOA

There is currently no consistent evidence that exposure to PFOS and PFOA causes adverse human health effects.

Because these chemicals persist in humans and the environment, enHealth recommends that human exposure to these chemicals is minimised as a precaution.

2. Major human exposure pathways

For the general community, enHealth considers ingestion of food contaminated with PFOS and PFOA is the major human exposure pathway.

In sites contaminated by PFOS and PFOA, drinking water and specific foods may be important exposure pathways.

3. Reference values for PFOS and PFOA

In early 2016, enHealth will convene an expert group to provide advice to the Australian Health Protection Principal Committee on the development of an Australian interim health reference value for PFOS and PFOA for consistent use in the undertaking of human health risk assessments.

The interim health reference value will consider relevant international guidelines, as well as contemporary scientific and technical issues.

4. Breast feeding

The significant health benefits of breast feeding are well established and far outweigh any potential health risks to an infant from any PFOS or PFOA transferred through breast milk.

enHealth does not recommend that mothers living in or around sites contaminated with PFOS or PFOA cease breast feeding.

5. Pregnancy

There is currently no consistent evidence that exposure to PFOS or PFOA causes adverse human health outcomes in pregnant women or their babies.

Nonetheless, enHealth recommends that pregnant women should be considered a potentially sensitive population when investigating PFOS and PFOA contaminated sites, with a view to minimising their exposure to PFOS and PFOA.

6. Blood tests

There is currently no accepted clinical treatment to reduce levels of PFCs in the human body.

Given the uncertainty that PFCs are directly linked to adverse health outcomes, blood tests cannot determine if the PFC levels in a person's blood will make them sick now or later in life.

Therefore, blood tests are not recommended to determine whether any medical condition is attributable to exposure to PFOS or PFOA and have no current value in informing clinical management, including diagnosis, treatment or prognosis in terms of increased risk of particular conditions over time.

It is noted that various organisations around the world have collected blood samples from people as part of ongoing investigations into PFC contamination of soil and water. The purpose of these tests was either as part of a defined research program, or to determine how much of these chemicals may be entering a person's body. The value of blood testing is limited to assessing exposure, such as monitoring over time, which may help determine the success of exposure reduction measures. However, given the long biological half-life of PFCs, frequent blood monitoring is of no value.

enHealth recommends that:

- blood testing has no current value in informing clinical management; and
- the monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures.