

SMOKE IMPACTS AT THE RURAL-URBAN INTERFACE

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THE ISSUE

Population shifts towards the expanding rural-urban fringe are likely to increase firefighting in rural-urban settings. The rural-urban interface however is a complex environment characterised by

- More complex and toxic mixture of combustion products compared to forest fires
 - Strong irritants, asphyxiants and carcinogens**
- More complex fire behaviour and smoke plume dispersion
- Different firefighting tactics to ensure protection of people and property



These aspects add complexity to predict firefighter's exposures and make it difficult to extrapolate from existing research findings on occupational exposures at bushfires.

While at structural fires, firefighters in general wear breathing apparatus protecting them against harmful chemicals in the air, firefighting at the rural-urban interface is often done without or with minimal respiratory protection. However, the likelihood for exposure to toxic fumes and particles, both during and after fires is high.



- What are the exposure concentrations to additional air toxics emitted from rural-urban interface fuels?
- What are the exposure concentrations to toxic residues in ash and dust?
- How will exposure to air toxics affect firefighters, emergency service workers and residents?
- Is the PPE adequate to protect against these air toxics?

"We now have sound research on smoke toxins and exposures in bushfire situations. However fires don't stay in the bush. Significant exposures also occur in the urban / rural interface. This research will bridge the research gap for agencies" (Robyn Pearce, Tasmania Fire Service, OH&S Surge Capacity Projects' End-User Leader)

OBJECTIVE

To identify and characterise potential hazards during firefighting at the rural-urban interface and assess exposure risks.



METHODOLOGY

Identification of air toxics

- Inventory of major materials and chemicals
- Laboratory or large-scale testing – characterise and quantify emission rates, chemical composition of combustion products and toxic residues in ash and dust



Determination of exposure levels

- Incorporation into adapted fine scale hazardous plume models to predict exposure levels
- If possible complemented by personal exposure monitoring

OUTCOME

The research project will expand our current knowledge on firefighters' exposure risks from smoke inhalation by including exposures during firefighting at the rural-urban interface. The findings will be incorporated, where possible, into ongoing research looking at the interrelationships between the various hazards firefighters face in their working environment.