NFCC
National Fire
Chiefs Council

Fire Contaminants risk assessment –

Fire investigation

Ref no:

Issue date:		Review date:		Issue no:	

Description of activity/task/environment/role assessed

These risk assessments are provided as a suite to support services to identify hazards related to fire contaminants, assess the level of risk, and implement appropriate control measures to reduce exposure to a level that is as low as reasonably practicable (ALARP). Each fire and rescue service remains legally responsible for undertaking and maintaining its own suitable and sufficient risk assessments. When creating their own risk assessments, services should take into account local risk, operational context and incident type.

This risk assessment has been developed by the NFCC Fire Contaminants Working Group and has been subject to an independent quality assurance process undertaken by a qualified occupational hygienist from Bureau Veritas. This process has provided additional professional scrutiny of the assessment, including the identified hazards, exposure risks and proposed control measures.

NFCC recommends that this document is used as risk assessment guidance, in line with your service contaminants risks, and reviewed in accordance with your risk assessment procedures.

Fire contamination is defined as a mixture of toxic, irritant and carcinogenic chemicals, the composition of which varies depending on the specific materials burning and the fire conditions. They can be released in the form of particles which will include aerosols, dust, fibres, gases, and vapours.

Contaminants can move from the incident ground through a chain of environments, increasing the risk of secondary exposure if not controlled. This chain includes incident ground, fire appliances and equipment, premises, internal workplaces, welfare facilities (showers, kitchens, rest areas), personal vehicles, and ultimately homes. Breaking this chain relies on effective management controls.

This risk assessment addresses the foreseeable hazards associated with fire contaminants encountered during fire investigation activities and sets out controls to minimise direct and secondary exposure. Fire investigators may be exposed through contact with contaminated materials and debris, and through activities that disturb and release contaminants into the air, including sifting, excavating, moving debris and recovering evidence.

For the purposes of this risk assessment, PPE is defined as follows:

- **Standard full PPE:** Disposable nitrile gloves (double up), overalls, safety boots and eye protection. Disposable overalls to be considered dependant on task.
- **Structural firefighting PPE**: Firefighting tunic and leggings, firefighting boots, fire gloves, fire hood and fire helmet.
- **Lighter firefighting PPE:** Firefighting tunic and leggings, firefighting boots, fire gloves and fire helmet.
- **Respiratory protective equipment (RPE):** This is defined as self-contained breathing apparatus (SCBA), or a FFP3-rated mask. Tight-fitting RPE must be face fit tested, as per HSE INDG479 guidance.

The most effective way to manage contaminant risk is to prevent exposure in the first place.

Relevant legislation

- Health and Safety at Work etc Act
- Health and Safety at Work (Northern Ireland) Order
- The Workplace (Health, Safety and Welfare) Regulations
- Workplace (Health, Safety and Welfare) Regulations (Northern Ireland)
- Provision and Use of Work Equipment Regulations(PUWER)
- Provision and Use of Work Equipment Regulations (Northern Ireland)
- Management of Health and Safety at Work Regulations
- Management of Health and Safety at Work Regulations (Northern Ireland)
- PPE (Personal Protective Equipment) regulations

- Personal Protective Equipment at Work Regulations (Northern Ireland)
- The Personal Protective Equipment at Work (Amendment) Regulations
- Personal Protective Equipment at Work (Amendment) Regulations (Northern Ireland)
- Control of Substances Hazardous to Health Regulations (COSHH)
- Control of Substances Hazardous to Health Regulations (Northern Ireland)
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland)

Activity / task / environment	**Hazard and outcome**	**Risk groups**	**Best-practice control measures**	**Level of risk**			**Additional control measures to consider to further reduce risk**
				L	S	R	
1. Attending a live fire investigation scene	Contamination from products of combustion associated with the incident. Exposure to contaminants by inhaling, ingestion, absorption or injection. **Acute health effects:** Immediate or short-term ill	A, B	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **At operational incidents risk assessment** • **Operational frontline appliances and vehicles risk assessment** • **Support and other vehicles risk assessment** • **Equipment risk assessment** • **Fire and rescue estates risk assessment**				

	health including irritation, breathing difficulties, toxic effects, burns, infection, serious injury or death **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		Wear full structural firefighting PPE. Use visual indicators, incident knowledge and gas monitoring to determine the level of PPE and RPE required. Provide contaminants awareness training. Provide training on post-fire hygiene.				
2. Attending a fire investigation scene following a fire incident	Fire contaminants present within the incident environment. Exposure to contaminants by inhalation, ingestion, absorption or injection.	A, B	Use visual indicators, incident knowledge and gas monitoring to determine the level of PPE and RPE required. Use sealed eye protection that is compatible with other PPE as per local documented safe systems of work. Wear appropriate forensically approved disposable suits to protect undergarments and skin.				

	Acute health effects: Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage and other life-limiting or fatal health conditions.		If a non-approved suit is worn, follow full local post-fire hygiene procedures. Follow local reporting procedures if personnel fire contaminants exposure occurs.				
3. Leaving a fire incident	Contamination from products of combustion associated with the incident. Exposure to contaminants by inhaling, ingestion, absorption or	A, B	Development and adherence to locally developed decontamination and cleaning procedures. Wear the correct/suitable level of PPE and RPE when making up and cleaning PPE or equipment. Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with				

	injection by personnel in the area. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, burns, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		standard-level PPE whenever handling any contaminated items, including equipment, PPE and clothing. Carry out initial cleaning of boots, helmet, BA sets and equipment on scene to remove gross and loose contamination. If further cleaning is required, bag and seal PPE and equipment before transporting it back to workplace. Carry out a final clean at the workplace. Clean investigative tools and equipment at the scene where possible. Carry out personal decontamination before entering the vehicle. Appropriately clean, dispose of or launder any items that become contaminated during their use. Bag and seal any tools and equipment that cannot be effectively decontaminated at the incident and stow the sealed bag away from the main vehicle cab or passenger compartment. Follow post-incident forensic decontamination procedures for vehicle and equipment.				

			Provide suitable washing and showering facilities for personnel to decontaminate, including warm water, soap, towels and facilities to enable effective hair drying. Ensure personnel undertake personal decontamination as soon as reasonably practicable following exposure. Provide clean clothing following decontamination. Establish suitable arrangements for laundering and managing contaminated workwear.				

12.Who could be exposed to the hazards? State identified persons at risk in column 3							
A: Firefighters	B: Officers	C: Instructors	D: Trainees	E: Control personnel	F: Non-operational personnel	G: Public	H: Other agencies

To be complete by fire and rescue services

Risk assessment sign-off	Name	Signature	Date	Review date
Risk assessment lead author				
Health and Safety Advisor				
Trade union health and safety reps				
Accountable manager				

Risk calculator

Risk is the chance that harm will be caused by a hazard. It is measured in terms of severity, likelihood & population affected.

A simple approach to quantifying risk is to define measures of likelihood and severity such as the descriptors given below. This allows the construction of a risk matrix which can be used as the basis of identifying acceptable and unacceptable risk.

Likelihood x Severity = Risk

Risk matrix

	Likelihood				
Severity	**Rare (1)**	**Unlikely (2)**	**Possible (3)**	**Likely (4)**	**Almost certain (5)**
Catastrophic (5)	**5**	**10**	**15**	**20**	**25**
Major (4)	**4**	**8**	**12**	**16**	**20**
Serious (3)	**3**	**6**	**9**	**12**	**15**
Minor (2)	**2**	**4**	**6**	**8**	**10**
Negligible (1)	**1**	**2**	**3**	**4**	**5**

Risk bands and suggested response

Risk band	Score	Required response
Low	**1–2**	Manage through routine controls. Maintain controls and review if circumstances change.
Moderate	**3–4**	Proceed where existing controls are effective. Consider further reasonably practicable controls; record, monitor and review where appropriate.
High	**5–12**	Further risk reduction is required. Review controls and reduce risk so far as is reasonably practicable. Where a residual High risk remains, apply explicit management or command oversight and continue to review the risk.
Very high	**15–25**	Intolerable for planned or non-emergency activity: do not commence or continue until risk is reduced. At emergency incidents, only proceed in exceptional circumstances where there is a compelling operational benefit, no safer reasonable alternative, and the decision is appropriately authorised, recorded and continually reviewed.

Likelihood descriptors

Level	Category	Descriptor
5	**Almost certain**	Expected to occur repeatedly or in most comparable circumstances unless further controls are applied.
4	**Likely**	Expected to occur at some point in the activity or relevant exposure period; has occurred repeatedly in comparable circumstances.
3	**Possible**	Could occur; credible and reasonably foreseeable, including events known to have occurred in comparable fire and rescue operations.
2	**Unlikely**	Could occur, but is not expected where controls are effective; uncommon and normally dependent on a less common combination of circumstances or control failure.
1	**Rare**	Exceptionally uncommon but still reasonably foreseeable; would normally require unusual circumstances or multiple independent control failures.

Severity descriptors

Level	Category	Descriptor
5	**Catastrophic**	One or more fatalities; a health effect reasonably capable of causing death or materially shortening life; or multiple permanent, life-changing injuries or cases of ill health.
4	**Major**	Permanent or irreversible injury or ill health; significant long-term impairment or disability; or a serious non-fatal health effect requiring substantial treatment or prolonged recovery.
3	**Serious**	Significant but reversible injury or ill health requiring medical treatment beyond first aid, temporary absence or restricted duties, or a short- to medium-term health effect requiring clinical assessment or treatment.
2	**Minor**	Minor injury or ill health requiring first aid or limited treatment; short-lived symptoms; little or no time away from normal duties; full recovery expected.
1	**Negligible**	No injury or ill health, or transient discomfort requiring no treatment and causing no lost time or lasting health effect.