



Housing Health and Safety
Rating System (HHSRS)

Case Studies

Group B
Physiological
Requirements

Hazard B13
Indoor
Air Pollutants

Example B13.1
Pre-1920
Mid-terrace
House
(Non-HMO)

Vulnerable Group
Persons of all ages

Multiple Locations
Yes

Related Hazard A4
Fire and Explosions



Dwelling

Description

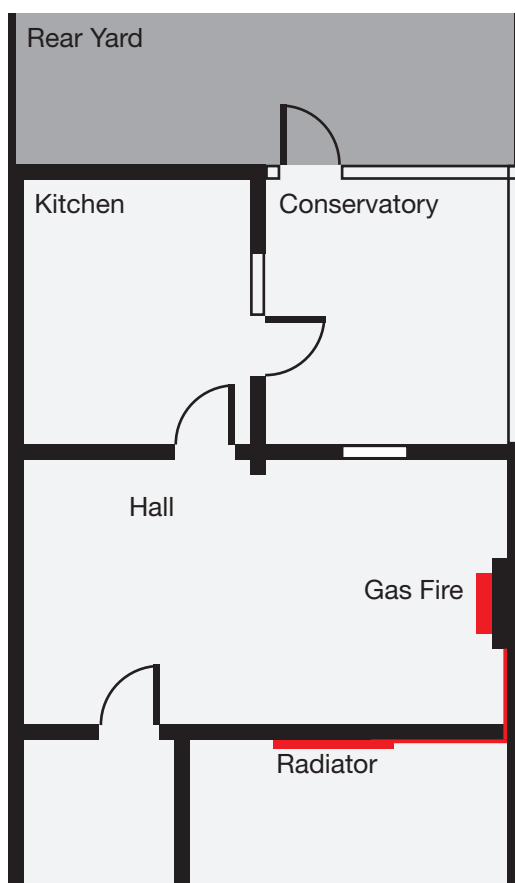
This property is a two-storey mid-terrace house built around 1900. It has solid brick walls and a slate roof.

There is no gas safety certificate, electrical installation condition report or EPC available for this property. The cooker in the kitchen is electric.

The property is owned and occupied by a couple.



1
Front exterior
Photo credit: jax10289 /
Shutterstock.com



2
Floorplan

Deficiencies

Description

Heating for the property is via a back boiler behind the gas fire in the rear living room, which serves radiators in the front room, both bedrooms and the bathroom. The central radiant in the gas fire is burnt through and the fire burns with a reddish flame.

There is a DIY-built conservatory – comprising a corrugated plastic roof and timber studding with a single-glazed window and door – that encloses the area to the rear right between the kitchen and rear living room. There is no direct ventilation to the rear living room and the small window opening into the conservatory is at a high level. The door in the conservatory provides the only means of ventilation as there are no opening windows in this room.

There is no carbon monoxide detector installed at the property.



3
Gas fire in rear living room



4
Window that opens into
conservatory

Relevant Baseline Indicators

0

Satisfactory
or N/A

1

Not
Satisfactory

2

Defective

3

Seriously
Defective

		Score	BI	Baseline Indicator
	Subject			
5	Sanitary Facilities: Kitchen	0 1 2 3	5.6	Suitable facilities for the effective and safe removal of fumes and moisture-laden air to the external air by means of a cooker hood or extractor fan; a cooker hood that only recycles the odour through an active carbon filter would not be acceptable, it must vent to outside. A mechanical extractor would be the normal mechanism for this function, in line with Baseline Indicator 16.1.
14	Lighting and Service	0 1 2 3	14.5	Gas appliances and flues provided for occupants are safe for continued use.
15	Heating and Insulation	0 1 2 3	15.4	Every dwelling shall have a properly installed heating system in good and safe working condition that is capable of safely and adequately heating all habitable rooms, bathrooms, and WCs. With the system being capable of heating the main living room to 21°C, and the remaining habitable rooms to a temperature of 18°C when the external temperature is -1°C. The system should not allow the temperature to exceed 25°C in any room during the heating season.
		0 1 2 3	15.6	Water heaters, wood stoves and other devices that employ combustion-burning fuels shall be vented to the outside of the structure in an approved manner that meets the manufacturer specification and in compliance with applicable standards and shall be supplied with sufficient air to support the continuous complete combustion of fuel and prevent back drafting, or the emission of harmful gases to any internal or enclosed spaces. The chimney must be maintained in accordance with the manufacturer requirements, including sweeping and inspection.
		0 1 2 3	15.7	Where appropriate (when burning fossil fuels as heating, hot water provision, or cooking) a hard wired CO detector with battery back-up must be installed in the room containing the appliance.

Relevant Baseline Indicators (continued)

0

Satisfactory
or N/A

1

Not
Satisfactory

2

Defective

3

Seriously
Defective

Subject	Score	BI	Baseline Indicator
16 Ventilation	0 1 2 3	16.2	All habitable rooms must have at least one window, door or skylight which opens to the outside and can be fixed in an open position. In addition, ventilation may also be provided by the presence of trickle vents, air bricks or passive stack ventilation.
	0 1 2 3	16.3	In each habitable room, the size of the openable windows, doors and skylights together must be at least 5% of the floor area of that room.
	0 1 2 3	16.4	All means of ventilation shall be maintained in good repair and working order.
19 Fire Safety	0 1 2 3	19.3	An annual gas safety check should have been undertaken within the last 12 months with a satisfactory result. Any heating provided by LPG shall be inspected by a suitably qualified engineer annually.

Other Relevant Matters

0

Satisfactory or N/A

1

Not Satisfactory

2

Defective

3

Seriously Defective

Matters affecting Likelihood of Harm

0	1	2	3	Appliance siting
0	1	2	3	Detectors
0	1	2	3	Flueless appliances
0	1	2	3	Flue outlet siting
0	1	2	3	Extractor fans
0	1	2	3	Lobby ventilation
0	1	2	3	VOC emitting
0	1	2	3	Use of biocides
0	1	2	3	Dwelling location

Matters affecting Harm Outcomes

0	1	2	3	Appliance siting
0	1	2	3	Detectors
0	1	2	3	Flueless appliances
0	1	2	3	Flue outlet siting
0	1	2	3	Extractor fans
0	1	2	3	Lobby ventilation
0	1	2	3	VOC emitting
0	1	2	3	Use of biocides
0	1	2	3	Dwelling location

Likelihood of Harm

Scale Points

Likelihood of harm from this hazard over the next twelve months

Very Likely		1 in 1
		1 in 2
		1 in 3
	Example Dwelling	1 in 5
Likely		1 in 10
		1 in 20
		1 in 30
		1 in 50
Unlikely		1 in 100
		1 in 200
		1 in 300
		1 in 500
Very Unlikely		1 in 1,000
	National Average	1 in 2,000
		1 in 3,000
		1 in 5,000

Score

1 in 5

Justification of Scoring

Likelihood of Harm

The likelihood has been increased to 'very likely' to take account of the condition of the back boiler, which is in disrepair, with the central radiant in the gas fire having burnt through resulting in the fire burning with a reddish flame. In addition, because the fire is also heating the back boiler, which provides the heating and hot water for the radiators, this fire will be on a significant amount of time, particularly in winter. This is likely to emit uncombusted gases and possibly lead to daily carbon monoxide exposure at certain times of the year.

In addition, there is a lack of adequate ventilation in this room, which is wholly unsuitable for a gas appliance of this nature due to a DIY-built conservatory that encloses the area between the kitchen and rear living room. There is no direct ventilation to the rear living room: its opening window into the conservatory is at a high level and the conservatory doesn't have any opening windows, the door being the only means of ventilation. The lack of ventilation will compound the effects of any gases released. The absence of any gas certification is a further aspect that gives cause for concern.

Overall, the likelihood of exposure to uncombusted and/or combustion products is higher than average and, in fact, very likely.

Harm Outcomes

Extreme		Severe		Serious		Moderate		
Death, permanent paralysis, etc.		Heart attack, serious fractures, etc.		Chronic stress, severe concussion, etc.		Broken fingers, moderate cuts, etc.		
Very Likely	50.0	Very Likely	50.0	Very Likely	50.0	Example Dwelling	92.0	
	30.0		30.0		30.0	National Average		
	20.0		20.0		20.0			
Likely	10.0	Likely	10.0	Likely	10.0		These scores are simply calculated as the sum of the other three harm outcomes subtracted from 100%	
	5.0		5.0		Example Dwelling + National Average	5.0		
	2.0		2.0			2.0		
Example Dwelling	1.0	Unlikely	1.0	Unlikely	1.0			
	0.5		0.5		0.5			
	0.2		0.2		0.2			
Very Unlikely	0.1	Very Unlikely	0.1	Very Unlikely	0.1			
	0.0		0.0		0.0			
National Average		National Average						
Score		Score		Score		Score		
1.0%		2.0%		5.0%		92.0%		

Justification of Scoring

Harm Outcomes

The gas boiler flue, which provides all heating and hot water, discharges combustion products into the kitchen, conservatory and living room. The boiler will be in use throughout the year, with particularly high usage in the cold winter months when the conservatory door is likely to be kept closed. This will increase the likelihood of harm in the Extreme and Severe categories due to the potentially high concentration of both uncombusted fuel gas and combustion products within the property.

The lack of a carbon monoxide detector does not allow for prior warning of dangerous levels of CO. As symptoms of CO poisoning are often confused with other common illnesses such as headaches and dizziness, any occupant is unlikely to take proactive steps towards a diagnosis for carbon monoxide poisoning. Consequently the Extreme and Severe harm outcomes have been increased to reflect this.

Safety Ratings

Scenario 1
As described in this document

Key

Category	Band	Score
1 Legal duty to take action	High	10,000
2 Discretion to take action	Medium	1,000
	Low	100

Likelihood of Harm

1 in 5

Extreme
1.0%

Severe
2.0%

Serious
5.0%

Moderate
92.0%

Category	Band	Score
1 Legal duty to take action	High	10,000
	Example Dwelling	2,884
2 Discretion to take action	Medium	1,000
	Low	100

Score

National Average

1

2,884

Scenario 2

After works meeting baseline indicators

Likelihood of Harm 1 in 2,000			
Extreme 0.0%	Severe 0.0%	Serious 5.0%	Moderate 95.0%
Category	Band	Score	
1 Legal duty to take action	High	10,000	
2 Discretion to take action	Medium	1,000	
	Low	100	
Score 1	Example Dwelling + National Average	1	

Justification of Scoring

After works meeting baseline indicators

The baseline indicators require full testing, servicing and replacement (where required) of gas appliances, and the installation of a CO detector.

They also require the provision of openable windows and adequate ventilation, which can easily be achieved by removal of the makeshift conservatory.

Compliance with these requirements will bring the likelihood of this hazard back to national average scores.

Scenario 3

After further improvements

Likelihood of Harm			
Extreme	Severe	Serious	Moderate
Category	Band	Score	
1 Legal duty to take action	High	10,000	
2 Discretion to take action	Medium	1,000	
	Low	100	
Score			

Justification of Scoring

After further improvements

Further improvements are not required.

Other Relevant Legislation and Guidance

Smoke and Carbon Monoxide Regulations

The Smoke and Carbon Monoxide Alarm (England) Regulations 2015 would not apply in this case as the property was owner/occupied at the time of assessment. If the property is rented again in the future, the Smoke and Carbon Monoxide Alarm (England) Regulations 2015 require landlords of non-licensable dwellings to fit a smoke alarm on each storey of their homes where there is a room used as living accommodation, and a carbon monoxide alarm in any room used as living accommodation which contains a fixed combustion appliance (excluding gas cookers). They must also ensure smoke alarms and carbon monoxide alarms are repaired or replaced once informed and found that they are faulty.

Updates

Matters for consideration listed in this section were correct at the time of publication. For the most up-to-date legislation and guidance in these areas, please visit the [gov.uk](https://www.gov.uk) website.