HM Government

Grenfell environmental checks – Stage 1 results

The following is designed to help you understand and navigate the information provided within the full Stage 1 report.

Contents

1. Introduction

Environmental checks in and around Grenfell Tower were announced in October 2018. Stage 1, of a two-stage programme (see Section 4), was carried out over the spring and summer of 2019.

The initial results from Stage 1 were shared with residents in July. We have now published the full Stage 1 report, produced by the independent specialists, AECOM, on behalf of the Multi-Agency Partnership, which is responsible for overseeing the programme.

The full Stage 1 report provides an overarching report, a series of Technical Notes, which provide detailed background information and all the data from the sampling.

For further information about chemicals, see Public Health England's chemical compendium on their website.

2. What the Stage 1 results show

These results are from the initial Stage 1 sampling, which was not designed to be final and definitive. However, we feel it's important to present exactly what we found.

The levels of chemicals found across the area are typical of those generally found in London.

They are not at high enough concentrations to be considered likely to cause 'an unacceptable risk' referred to under the Part 2A of the Environmental Protection Act.

We do not, at this stage, consider there to be an elevated risk to anyone's health from potential land contamination because of the Grenfell Tower fire.

There is nothing to suggest anyone needs to take any immediate action. If this were purely a legal and regulatory matter, the overall findings at these levels would not require any further action.

Most chemicals were found to be below generic screening criteria (GSC) which means that long-term exposure to these chemicals would represent a low (minimal or without appreciable) risk to health. Where chemicals do exceed GSC, they are typical of those generally found in urban areas across England.

The GSC are used across the UK and within the legal framework as the first step in the process of identifying and dealing with potentially contaminated land. Chemicals at levels below the GSC are 'ruled out' of requiring further assessment.

Those chemicals above the GSC normally require further assessment to accurately determine the level of risk. For ease of reference, the rest of this document will refer to GSC as 'screening levels'.

The existing health advice from Public Health England remains in place. It is based on general good practice, for example washing your hands after gardening, working or playing in soil and washing and peeling home-grown fruit and vegetables.

These results do not change the public health advice, but if you have any concerns, please visit your GP. Enhanced health checks are in place for anyone living in North Kensington. More information on the health offer from the NHS is available here.

We will continue to investigate the potential for contamination through Stage 2 by undertaking more detailed sampling, mainly focusing on those chemicals that exceeded the screening levels.

3. Key results

- Most chemicals tested for were found to be at levels below screening levels. Chemicals associated with fires, such as brominated flame retardants, were either not found at all or only in very few of the samples and at concentrations many times lower than screening levels.

- Some other chemicals were found at levels which exceeded screening levels. Lead was found in most samples at levels above its screening level and Polycyclic Aromatic Hydrocarbon (PAH) Benzo(a)pyrene (BaP) was also found in a small number of samples above its screening level. These contaminants are commonly found in urban areas and in most cases the levels found in Stage 1 were within the normal background range for London. This means they could have originated from historic sources.

- The highest level of lead found was 12 times higher than the screening level and the highest level of benzo(a)pyrene was 3 times higher. However, these levels are typical of those generally found in London and other urban areas across England.

- Lead and BaP will be the focus of further investigation in Stage 2. Testing for asbestos, dioxins, furans and PCBs will also be included to reduce uncertainty and ensure that the Stage 2 testing does includes further investigation for chemicals which are associated with building fires.

- Asbestos and synthetic vitreous fibres (SVF) were found occasionally in samples, but always at concentrations below screening levels. Some chemicals were found in all the samples but at concentrations below screening levels. These include dioxins, furans and dioxin-like polychlorinated biphenyl (PCBs).

- Other chemicals were found in very few samples and at levels below screening levels. These include organophosphorus compounds, isocyanates and volatile organic compounds (VOCs) including benzene. For example, benzene was only found in 1 sample and at levels 11 times lower than the screening level.

- Non-dioxin- like polychlorinated biphenyls (PCBs) were only found in a few samples and none of these exceeded the screening level.

You can find out how the Stage 1 environmental checks were carried out (the 'investigation methodology') here.

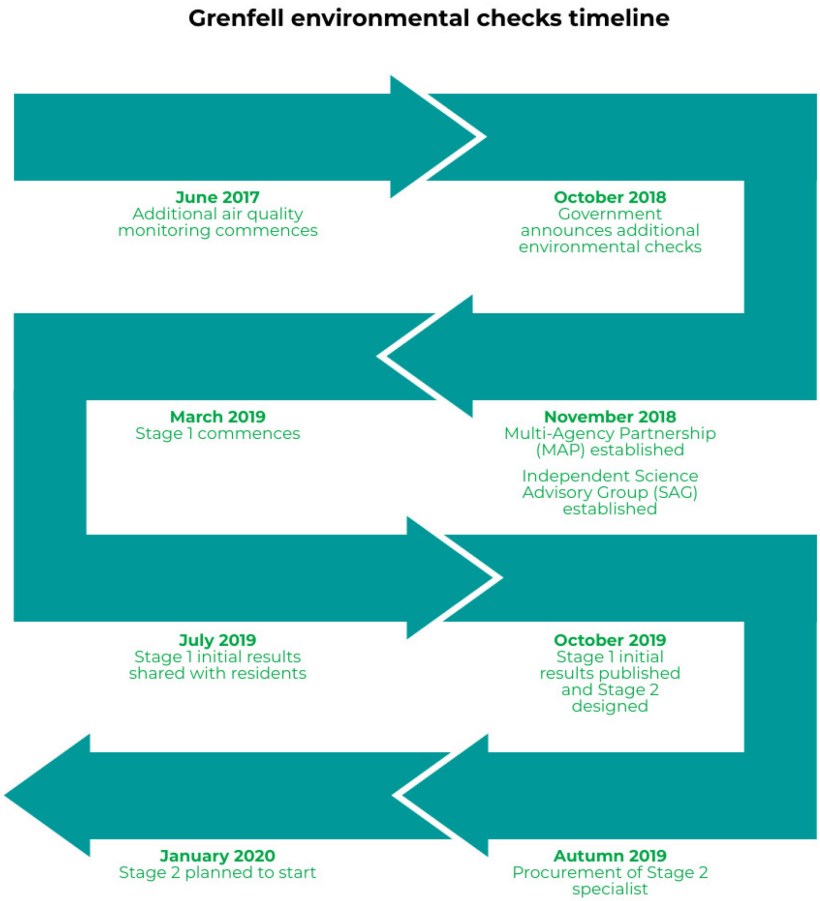
4. Purpose of Stage 1

The environmental checks are a two-stage process. In Stage 1, the independent environmental specialist, AECOM, gathered background information, undertook exploratory sampling and a pilot study to inform a preliminary risk assessment and the design of Stage 2. We have now published their full results from Stage 1 and the design for Stage 2.

Stage 2 will include further sampling and a health risk assessment to provide final conclusions and recommendations.

Additional air quality monitoring has been in place since June 2017 and has not identified any cause for concern. The air around Grenfell Tower is monitored continuously and the data is reviewed and analysed at least once per day. Like many parts of London, air quality around Grenfell can be affected by pollution, such as that due to heavy traffic and gas-fired boilers. You can find out more here.

The Grenfell environmental checks timeline below outlines the programme to date and next steps.



5. What was done in Stage 1

The environmental checks are being carried out under Part 2A of the Environmental Protection Act 1990, which provides the legal framework for identifying and dealing with contaminated land that presents an unacceptable risk to health or the environment.

A methodology paper, including a summary and a series of information sheets sets out the approach used to analyse and interpret the Stage 1 findings.

a) Information gathering

This consisted of gathering information on chemicals likely to have been released from the fire and chemicals likely to be present in urban soil. AECOM looked at published studies on the range of chemical concentrations found in urban soils in the UK, as well as information from public authorities and other organisations into emissions from the Grenfell Tower fire. In addition, AECOM looked at analysis by the Met Office published here into the smoke plume that was produced by the fire and where particles were most likely to have been deposited on the ground. All this information helped to determine what to test for, and where to test.

AECOM also looked at background information, such as local historical land use and previous ground investigations into contamination (mainly planning applications), as well as the clean-up operation following the fire to inform their understanding of the site and possible sources of contamination.

You can find out more about the background information in Technical Notes 05, 06, 07, 08, 09 and 10 & 12.

b) Sampling

Sampling took place to understand what chemicals may be present and at what concentrations to understand their potential significance. It also helped to develop the sampling and analytical techniques needed for Stage 2. Site walkovers with residents and input at community workshops helped inform this.

Samples were taken by AECOM in April and June 2019 at 20 locations within 1km of Grenfell Tower. Sixty-seven samples were taken to a depth of 5cm, including 24 duplicates. The duplicate locations were selected at random in line with best practice and to help better understand the results.

You can watch a video of the sampling taking place here.

The image below shows a record of one of the samples being taken, including the sampling location being measured and the details of the sample recorded.

The second image shows the stored samples and the information about the location of the samples, ready to send to the laboratory for analysing.

In addition, AECOM carried out a pilot study at Waynflete Square to understand how much variation there might be in samples near to each other and at different depths. This involved taking 26 samples, some of which were taken to a depth of 10 to 15cm. It also included 8 samples in a small area to explore possible differences in concentrations on a smaller scale.

Locations for the testing and pilot study were selected from feedback gathered at the community workshops and site walkover, information on the smoke plume and wind direction, proximity to the Tower and ease of access.

The samples were sent to Element Materials Technology, a laboratory specialising in testing soils for environmental contaminants and accredited by the United Kingdom Accreditation Service (UKAS), to be analysed. The laboratory was supported by Marchwood Scientific Services and RPS Mountainheath, both UKAS accredited laboratories.

The factual data from the soil sampling, including the laboratory analytical certificates, is included in Technical Note 15. And you can find out more about how residents got involved in Technical Note 14.

c) Preliminary risk assessment

AECOM evaluated the links between the level of the chemicals found in soil (this is called the 'source'), the people or the environment that could potentially be affected (this is called the 'receptor') and how people or the environment might come into contact with the chemicals (this is called the 'pathway'), for example breathing.

The level of chemicals found in the soil have been compared against screening levels and against local, regional and national background soil levels, where this information is available. (For example, the London Earth Study on topsoil in London and the UK and the Herbage Survey on urban soils across the UK. You can find out more about this in Technical Note 9.)

For harm to occur there must be a connection between the source, receptor and pathway and all three bits must be present. Where these connections are present these are called 'potential contaminant linkages' (PCLs).

The preliminary risk assessment identifies these potential contaminant linkages. These linkages have then been prioritised for further investigation on a ranking basis of highest, high, medium, low and lowest. This helps to identify which, if any, should be assessed further.

You can read more about the Preliminary Risk Assessment in Technical Note 16.

6. Detailed results

a) Results of information gathering

Information from residents identified that debris from the Grenfell Tower fire was deposited within a few hundred metres around the Tower and to the north west to at least 1km distance. This is consistent with the Met Office modelling (see Section 5a) and supported by information on where debris was cleared by the police, fire brigade and the council. AECOM therefore set the area for sampling within 1km of the Tower, as this is where debris is most likely to have potentially caused contamination of the soil.

Reviews of existing background levels of contaminants from existing UK surveys and data; planning applications and current land use identified that several chemicals of potential concern (COPCs) found, such as lead, benzo(a)pyrene, PAHs, dioxins and asbestos were already present. In addition, evaluation of historical maps indicated a range of land uses, such as iron works, garages and railway lines and stations, that could have caused contamination, in addition to potential ground contamination caused by bomb damage during World War Two.

Changes in the soil that might represent historical use were also noticeable in the deeper samples during the pilot test at Waynflete Square, with brick, concrete and flint gravel present.

You can find out more about the background information in Technical Notes 05, 06, 07, 08, 09 and 10 & 12.

You can also view a map here which shows information gathered at the community workshops; from the Met Office modelling; historic land use; planning applications, Stage 1 sampling locations and the locations identified for sampling in Stage 2.

b) Results of the sampling

Information on all the chemicals that were found at levels above screening levels at the sampling location is available here.

You can find information on all the chemicals AECOM found at each of the sampling locations, the full sampling data and the pilot study here.

The results of the laboratory analysis of the soil samples did not reveal obvious patterns in the spread of concentration of the chemicals assessed to suggest that they might have originated from the Grenfell Tower fire, rather than being from historic (pre-fire) land uses.

Some of the lowest concentrations of chemicals were found within the Grenfell Tower site cordon. While this area was significantly affected by debris as a result of the fire, the result suggests that the effect of either the clean-up of the debris and/or the firefighting water used during the fire is that there is very little detectable soil contamination.

See link here for charts that look at some of the chemicals found, compared with the national guidelines, normal background concentrations and the background data range.

c) Results of the preliminary risk assessment

Following the preliminary risk assessment (see Section 5c) the potential contaminant linkages of the chemicals found during the sampling were prioritised by AECOM on a ranking basis of highest, high, medium, low, lowest.

Highest or high possibility of a significant contaminant linkage
No potential chemical linkages were identified as highest or high.

Medium possibility of a significant contaminant linkage
Concentrations of polycyclic aromatic hydrocarbons (PAHs), were broadly comparable to those reported in published surveys. The PAH benzo(a)pyrene, which is an organic compound formed from the incomplete combustion of materials, was found in all samples. The levels found ranged from 0.037 mg/kg to 8.61 mg/kg, with the highest level of benzo(a)pyrene 3 times higher than the screening level of 2.7 kg/mg.

Lead was also found in all the samples. The lowest level at which it was found was 17mg/kg, while the highest was 2,621mg/kg. This is 13 times higher than the screening level guideline of 200 mg/kg.

Both these chemicals are commonplace in the urban environment and the levels detected are below the maximum concentrations observed during the pre-fire local ground investigations.

Low – unlikely to be a reasonable possibility of a significant contaminant linkage
Dioxins, furans and dioxin-like PCBs are a group of toxic substances formed mainly during the incomplete combustion of materials containing carbon, oxygen and chlorine or bromine. They are commonly found as a result of fires in most fire effluents and were found in all the samples. None were above screening levels and the concentrations found were broadly comparable to those reported in published surveys of urban soils.

Cyanide, which is a natural chemical found in the environment, was found in all the samples at levels ranging from <0.5 (most of the samples) to 10.5 mg/kg and was therefore not detected above the reporting limit. The highest level found was 7 times lower than the screening level of 78 mg/kg.

Chloromethane is an organic compound and a colourless, odourless, flammable gas. It was found in all the samples. In some of these it was found at levels less than <3, against a screening level of 9.8 ug/mg. However, in 41 of the samples, it exceeded the screening level, with the highest level found 5 times higher. It is naturally present in soil and is common in urban air.

Metals such as aluminium, antimony, arsenic, barium, chromium, manganese, nickel, mercury and thallium are present in building materials. These are present in naturally occurring minerals in soil.

The results for Cresols which are organic compounds, are <20ug/kg (i.e. not detected above method reporting limit) except for 4 samples. The maximum Cresol amount found in the samples was 313ug/kg compared to guideline value of 180ug/kg.

Lowest possibility of a potential contaminant linkage

Non-dioxin-like polychlorinated biphenyl (PCBs), which are organic chemicals, were found in very few samples. For the sum of the seven non-dioxin-like PCBs tested for, no samples exceeded the national guideline level of 1000 ug/kg, with the highest level found at 407ug/kg, which is 2 ½ times lower than the screening level.

Volatile organic compounds (VOCs), which are given off when things burn were found in very few samples. For example, benzene was only found in 1 sample at a concentration of 96 ug/kg, which is 9 times lower than the screening level of 870 ug/kg.

Organo-phosphorous compounds were detected in 5 samples and none of these were above the screening level. These compounds can be found in electrical equipment.

Asbestos, which used to be commonly used in building materials, was found in Waynflete Square and then irregularly in other areas. It was not typically found in the duplicates from the same location or in both samples from one area.

Synthetic vitreous fibres (SVF), which are associated with glass wool used in insulation foam panels in buildings, were detected in 19 of the samples.

Chemicals associated with brominated flame retardants, were either not found in any samples or only in very few. For example, concentrations of organophosphate ester flame retardants and isocyanate compounds (released when foam materials are burned) were found in 1 to 4 samples and at concentrations several thousand times lower than screening levels.

7. Next steps – Stage 2

A further targeted investigation will take place into the potential risk of land contamination and the results will be used to consider any potential risk to public health.

The investigation will:

- Focus on those chemicals where a ‘significant contaminant linkage was found. These are lead and PAHs. Asbestos, dioxins and furans will also be investigated further.

- Target areas of land and investigate them in a systematic way to assess the potential risks under Part 2A.
- Involve sampling up to a 1km radius from the Tower under the smoke plume and within 500m in all other directions
- Prioritise sensitive land uses such as schools/nurseries and community gardens where fruit and vegetables are grown

We will continue to ensure that residents are involved during Stage 2 and appreciate their involvement and help during Stage 1.

You read about the design for Stage 2 here.

8. Safeguards

Stage 1 was delivered by an independent specialist, AECOM. They are a global company with proven expertise in land contamination investigations including over 50 Part 2A investigations across the country.

The Stage 1 results have been independently reviewed by the National Quality Mark Scheme Suitably Qualified Person (SQP), Dr Paul Nathanail of Land Quality Management Limited, who also observed and reviewed the specialists' work at each stage. You can view the SQP declaration here.

The testing process has been overseen by an independent group of scientific experts – the Science Advisory Group – (SAG) who stated that the 'the programme of environmental checks for Stage 1 was scientifically rigorous and that the Group has confidence in the measurement of the data.'