# Sandringham Avenue Allotments Risk Summary

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1. Part 2A of the Environmental Protection Act 1990 ("Part 2A") sets out a framework that enables local authorities to deal with unacceptable risks posed by land contamination.

2. Statutory Guidance has been issued to explain how local authorities should implement Part 2A (Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance - the "Statutory Guidance"). In particular, the Statutory Guidance sets out how local authorities should go about deciding whether land is "contaminated land" in the legal sense of the term.

3. Under Part 2A, and following the Statutory Guidance, Wyre Council has completed a detailed investigation and assessment of Sandringham Avenue Allotments.

4. This document is a Risk Summary of the type envisaged in paragraphs 3.33 to 3.36 of the Statutory Guidance. The purpose of this Risk Summary is to set out Wyre Council's understanding of the risks to receptors presented by the Sandringham Avenue Allotments.

**Background**

PFOA

5. Industrial activities at the AGC Chemicals Europe Ltd facility ("AGCCE Facility", which historically formed part of a wider ICI chemical works) spanning several decades included the use and production of various PFAS chemicals. Information presented by the company to the Environment Agency (EA) indicated significant atmospheric releases of PFOA (Perfluorooctanoic Acid - a type of PFAS - between the early 1950s and 2012 when it was phased out.

6. PFOA is one of the more widely studied PFAS chemicals. PFOA was used primarily in industrial processes as a processing aid in the manufacture of fluoropolymers. One of its principal applications was in the production of PTFE (polytetrafluoroethylene), a fluoropolymer used in a wide range of industrial applications and consumer products requiring non-stick, heat-resistant or chemical-resistant properties.

7. PFOA does not break down easily in the environment. It can accumulate in plants and animals and can move through soil because it dissolves easily in water and does not stick strongly to soil particles. This means it can be taken up by plants and, over time, move through the food chain.

8. Once released, PFOA can stay in the environment for many years. It can also move away from where it was originally released, particularly underground through groundwater, meaning it may affect a wider area over time.

Possible health effects

9. PFOA has been linked to a range of possible health effects including higher cholesterol, changes in liver function, reduced response to some vaccines, effects on the thyroid, and lower birthweight in babies. Studies in animals have shown effects on development and the liver at higher exposure levels.

10. PFOA is also officially recognised as carcinogenic to humans by the International Agency for Research on Cancer (IARC), which is the cancer agency of the World Health Organisation.

11. Health effects linked to PFOA, and PFAS generally, develop only after long-term, repeated exposure over many years or even decades.

Inspection

12. The EA made Wyre Council aware of concerns relating to potential PFOA deposition onto land surrounding the AGCCE Facility.

13. At the request of Wyre Council, under paragraph 2.14 of the Statutory Guidance, the EA is performing a detailed inspection of the main AGCCE Facility and surrounding land on the Council's behalf. The on-site part of the inspection is being completed voluntarily by AGC Chemicals Europe under EA oversight, The off-site part of the inspection is being completed by the EA.

14. That detailed inspection remains ongoing. However, the inspection in so far as it relates to the Sandringham Avenue Allotments is now complete.

*Current use*

15. Sandringham Avenue allotments are currently in use as allotments (although holders are being advised to stay away). There are no formal, informal or temporary uses to which the land could be put without needing planning permission that are reasonably likely as far as Wyre Council is aware.

*Conceptual site model*

16. A conceptual site model is an approach to indicate the possible relationships between contaminant sources, pathways and recognized receptors (the "contaminant linkages") at the site. It is standard practice to develop this type of model for a contaminated land site.

17. The conceptual model for Sandringham Avenue initially identified two contaminant linkages:

    a. a contaminant source - PFOA in shallow soil; pathways involving ingestion of produce that have absorbed PFOA plus accidental soil ingestion, dermal contact, and inhalation of soil particles; and receptors, in this case humans using the allotments and consuming produce.
    b. a contaminant source - PFOA in shallow soil; pathway of plant uptake of contamination from the soil; and receptors, namely produce grown on the allotments.

18. Note in (a) that dermal contact, and inhalation of particulates were subsequently discounted as exposure pathways, with ingestion of contaminated produce identified as the primary exposure route.

19. Note in (b) that consideration of this contaminant linkage could not be considered further as part of the inspection owing to a lack of produce available from the Sandringham Avenue allotments for sampling.

*Sampling and testing*

20. The inspection was undertaken in two phases. Phase 1 took place in January 2025. Soil was sampled from 12 locations, with 2 samples taken at

different depths from each location, down to a maximum depth of 0.6 m. All 24 soil samples contained PFOA.

21. Phase 2 was a more detailed exercise, building on the findings of the previous stage. Sampling was undertaken in October 2025. A total of 96 samples were taken across 32 sampling points down to a maximum depth of 0.6 m..

22. In summary, over both phases, PFOA was detected above laboratory detection limits in 119 of the 120 samples within the critical 0-0.6m depth interval, with the average concentration significantly exceeding the interim Category 4 Screening Level (C4SL) for human health.

*Contaminants other than PFOA*

23. Whilst PFOA has been the main chemical of concern and the focus of the Part 2A investigation, a wider suite of PFAS chemicals, including PFOS, PFHxS and PFNA, were also tested for in the soil samples collected. A few of these were positively identified, but only at low levels. They are not considered to be significant contributors to risk, and there is no evidence that these chemicals were released from the AGCCE Facility.

**Possible remediation**

24. Remediation by removing and replacing the contaminated soil is the most effective long-term solution, as it fully breaks the link between the contamination and people.

25. Possible alternative options include creating raised growing beds using clean imported soil, placing protective layers or membranes over the ground, limiting or stopping the eating of produce grown on the land, and continuing to monitor the environment. A combination of approaches can be adopted. A degree of cooperation from allotment holders will be needed in relation to these alternative solutions.

**Risk Understanding – Human Health**

26. Wyre Council can see from the information provided by the EA that, in general terms, exposure to PFOA gives rise to the possibility of significant harm to human health.

27. With PFOA contamination in the soil established, the wider weight of evidence (including the findings from the Occupation Road Allotments) indicating PFOA within the produce, and human ingestion of the produce obvious, Wyre Council has to decide whether this makes the allotments "contaminated land" under Part 2A.

28. The allotments are "contaminated land" where:

    a. significant harm to human health is being caused, or
    b. there is a significant possibility of significant harm ("SPOSH") being caused.

29. As far as Wyre Council is concerned, it is not the case at the moment that the PFOA at the allotments is causing significant harm to human health of the type relevant to Part 2A. Amongst those visiting the allotments and consuming the produce, the Council is not aware of any instances or suggestions of harm of any sort.

30. As to whether or not there is a SPOSH to human health, consideration has first to be given to the "possibility of significant harm" and the robustness/uncertainty in the relevant evidence (see paragraphs 4.10 to 4.15 of the Guidance), and then to the question of whether that possibility is significant (see paragraphs 4.16 to 4.29 of the Guidance).

*Possibility of Significant harm?*

31. The Council believes that there is a clear possibility that significant harm to human health can result from land in this condition as it is currently being used.

32. Knowledge in this area continues to evolve, but it is clear that the wider scientific research into this topic highlighted by the EA broadly indicates that exposure to PFOA is associated with a range of adverse health outcomes in humans and animals, including carcinogenic, immunological, metabolic, and developmental effects. These findings are supported by evidence from both epidemiological studies and experimental animal toxicology.

33. As for when these health effects might manifest, health effects linked to PFAS generally develop only after long term, repeated exposure over many years or even decades. Although PFAS can be taken into the body soon after eating contaminated food, any health effects tend to develop slowly because these chemicals break down very slowly and remain in the body for a long time.

*Is the possibility of significant harm "significant"?*

34. As part of this question, according to paragraph 4.17 of the Statutory Guidance, Wyre Council has to decide which of four health-based risk categories apply, from Category 1 (highest risk) to Category 4 (lowest risk).

35. Starting with the outlying categories:

    a. Category 1 is where there is an unacceptably high probability that significant harm would occur if no action is taken to stop it. In these circumstances, the local authority must assume SPOSH to human health.
    b. Conversely, Category 4 is where there is no risk, or the level of risk is low. In these cases, a SPOSH to human health does not exist.

36. It is clear from the information provided by the EAEA that neither Category 1 nor Category 4 describes the human health risk here.

37. A decision therefore has to be made between Category 2 and Category 3, noting that there is a starting presumption of Category 3.

    a. Category 2 represents a level of risk that is lower than Category 1 but still unacceptable. The local authority has to ask whether there is a strong case for considering that the risks are of sufficient concern that the land poses a SPOSH, with all that this might involve.

    b. Category 3 applies where the authority concludes that the strong case described in Category 2 does not exist. In category 3 cases, the legal test for SPOSH is not met. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted.

38. The Council considers that this is a case of Category 2 risk, and that there is a strong case for considering that the risks are of sufficient concern that the land poses a SPOSH. There is clear evidence of a contaminant linkage at the allotments based on the PFOA found in soils and (based on the wider weight of evidence, in particular from the Occupation Road allotments) in crops grown by allotment holders, and resulting estimated PFOA exposures for adult and child receptors at the allotments.

39. There is a precautionary element to the Council's approach, as envisaged in the Statutory Guidance. The EA's underpinning technical evaluation has only identified a moderate to high possibility of potential adverse effects

from the estimated exposures on various epidemiological markers, and there are differences of opinion at a scientific level as to whether these epidemiological markers themselves are "significant harm". Clarity on this may not be available for some time. However, the Council has considered:

c. the wider scientific research into this topic broadly indicates that exposure to PFOA is associated with a range of adverse health outcomes in humans and animals, including carcinogenic, immunological, metabolic, and developmental effects. These findings are supported by evidence from both epidemiological studies and experimental animal toxicology.

d. That PFOA is highly persistent in the environment and toxic with exposure pathways (including food) that can lead to accumulation in the human body. The evidence base also indicates that delays in regulatory action prolong exposure and increase the potential for population-level health effects.

40. In this context, the application of a precautionary, weight-of-evidence approach under Part 2A is both justified and consistent with good practice.

Understanding of uncertainties

41. The Council recognises that there are uncertainties in its assessment that are consistent with, and inherent to, the assessment of legacy contamination of this nature and the associated evaluation of potential health risks.

42. In this context, the most material uncertainties relate to:

a. the magnitude of site-specific exposure; and
b. the interpretation of the health significance of that exposure.

43. In relation to (a), the assessment has been carried out without analysis of allotment produce from the Sandringham Avenue allotments. Such produce was not available. However, produce data was available from another allotment site at Occupation Road and this has been considered.

44. While further investigation and data collection may refine these areas, a degree of residual uncertainty is inevitable, given the persistence, heterogeneity, and evolving toxicological understanding of PFAS.

45. Importantly, the Part 2A Statutory Guidance makes clear that decisions should be based on the balance of probabilities, rather than the elimination of uncertainty. The Statutory Guidance indicates that

uncertainty should be managed by drawing upon multiple, consistent and scientifically defensible lines of evidence, rather than reliance on any single dataset or threshold. It is for the Council to use its judgment to form a reasonable view of what it considers the risks to be on the basis of a robust assessment of the available evidence.

## Risks in context

46. Individuals risk exposure to numerous sources of PFAS because it is widely detected in the environment and exists in a range of products in everyday use. In relation to the those exposed to PFAS at the allotments, whether via ingestion of produce or otherwise, it is very likely that they have been or are being exposed to other unrelated sources of PFAS, perhaps materially so. In other words, dealing with the source at the allotments is unlikely to completely eliminate their exposure to PFAS.

47. In addition, many of the physical conditions suspected to result from PFAS exposure are known to be influenced by other factors. In other words, eliminating PFAS exposure in any individual will not necessarily mean that the risk of developing these physical conditions falls away.

48. It is important, however, to focus not on whether material PFAS exposure occurs elsewhere, or whether risk of injury arises from other non-PFAS factors, but whether the land in question is making a meaningful contribution to overall PFAS exposure and risk. It is clear to the Council that it is. Exposure to PFAS arising from the allotments is a material, measurable and non negligible additional exposure on top of other background contributions.