



# A Shot in the Dark

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The Forensic Science Service (FSS) was the largest employer of gunshot residue (GSR) experts in England and Wales with an impressive array of instrumentation required for round the clock analysis of the samples taken from suspects of gun crime. Since its closure in 2012 the GSR criminal casework load was split between three main private forensic providers depending on their success or failure at tendering for the work being offered by the police forces in England and Wales. Less than half of the number of GSR experts from the FSS now work for these providers and the majority of the remainder left the profession. Scotland, Northern Ireland and Ireland have their own publicly funded forensic science providers. All of the laboratories must be accredited to the International Quality Standard ISO 17025:2005<sup>1</sup>.

The examination of exhibits for the presence of GSR is generally undertaken at the laboratories. Some police forces may in-source this step in the forensic chain. The private forensic providers may also be commissioned to carry out defence work. Clearly however, this will only be for cases where they have not undertaken the work at the request of the police. In this instance, an alternate forensic provider may be commissioned or one of the independent forensic consultancies. One such consultancy is Forensic Firearms Consultancy who are regularly commissioned by solicitors, government organisations, law enforcement agencies and private individuals, across the globe, for both prosecution and defence work.

Overseas the analysis and reporting of GSR is undertaken by a mixture of government funded and private laboratories. There can be considerable differences in the way in which not only the GSR is

examined for but also in its analysis and subsequently the manner in which the findings are presented in Court. It would be fair to say that the analysis for GSR, and ultimately the interpretation placed on the findings, is not the same no matter who does it...

When a gun is fired thousands of microscopic particles, called gunshot residue, are produced by the ammunition. They are emitted from the end of the muzzle of the gun and from any gaps or openings in the gun's action and can be deposited on the firer, any persons or surfaces sufficiently close to the firer, and the gun itself. The recovery and identification of GSR particles can help address questions such as, 'has the suspect recently fired a gun?' That the particles originate from a firearm is rarely contested. Of far more interest to the court is how these particles came to be on a suspect's clothing or hands. Because of its potential evidential significance in putting somebody at the scene of a shooting GSR is one of the most heavily scrutinised types of trace evidence in criminal investigations.

In the early 1970's work began independently at the Metropolitan Police Service Forensic Laboratory in London and at the Aerospace Corporation in California on a new method of identifying individual particles of GSR using the scanning electron microscope equipped with an x-ray analyser, this equipment is known as SEM-EDX. Importantly, this work established that discrete particles composed of lead, barium and antimony appeared to occur only in percussion primer residue. There was no known source other than firearms, hence the technique became the first conclusive method for identifying GSR. This particle analysis method is still employed today.

*1, General requirements for the competence of testing and calibration laboratories ISO/IEC 17025:2005 (E), Second Edition.*