



TSW Analytical
DELIVERING SOLUTIONS



TSW Trace

Proven, Proprietary Technology



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TSW Trace™ is a robust, definitive, tested and validated scientific method for the establishment of an items provenance. TSW Trace™ brings together over 30 years of research and application across various disciplines. The method is delivered by the TSW Analytical Pty Ltd Forensic Science Services team who, combined, have over 60 years of advanced research and forensic casework experience.

- TSW Trace™ has been developed by TSW Scientists over the past 30 years.
- TSW Trace™ is a method that robustly determines the provenance of an item.
- TSW Trace™ uses a variety of scientific approaches to determine the fingerprint of a sample and link it to its origin.
- TSW Trace™ is routinely employed as a forensic tool and is delivered by expert forensic chemists and investigators.

The Science

The team delivering TSW Trace™ access cutting edge chemical analysis technology to determine key markers which are used to characterise an item.

The TSW Trace™ process determines a fingerprint (based on elements, isotopes, and molecules) which is characteristic of an items' origin. The team, comprised entirely of higher skilled analytical scientists, access a variety of analytical instrumental technology to determine this robust characteristic fingerprint.

The application of chemical profiling to Forensic Investigations is well documented. The TSW Forensic Science Services team are world leaders in this area and specifically the application of elemental fingerprinting to provenance establishment tasks.

The scientific basis and applications of TSW Trace™ have been published extensively by the TSW Forensic Science Services and Food Forensic Team. In addition to, the more than 100 peer reviewed publications the applications have been presented extensively at international scientific conferences, forms the basis of book chapters and Gold Fingerprinting, which contributes the scientific foundation, features in the internationally referenced forensic treatise for Expert Evidence.



What is Elemental Fingerprinting?

Every substance, whether natural or synthetic, is not pure and will contain a cocktail of "contaminants" in concentrations that range from single atoms or molecules to percentages. These contaminants can be used to construct a fingerprint.

This elemental fingerprint is used by the TSW Trace™ team to determine the origin of where an item has come from and also how it may have come about.



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Applications

TSW Trace™ can be applied to almost anything of which information of provenance is required. The team have published widely the applications with relevant examples including precious and conflict metals, diamonds, physical evidence from crime scenes, food, drugs, artwork and antiquities.

- **GOLD, DIAMONDS, PRECIOUS & CONFLICT METALS** - TSW Trace™ has been routinely applied to tracing stolen gold or diamonds back to their mine (even the pipe) of origin. This method has been used successfully in forensic investigations all over the world. Gold Fingerprinting is the oldest of the TSW Trace™ application with the first case documented over 30 years ago. TSW Trace™ is also used to determine if a Diamond is synthetic (or natural) and investigate or verify commodities sourced from conflict zones (blood diamonds).
- **SCENES OF CRIME INVESTIGATION** - The TSW forensic science services team undertake routine forensic investigations which employ the TSW Trace™ method. Typical examples include the analysis and profiling of physical evidence that may be recovered from crime scenes or person(s) of interest. The team have also successfully employed the provenance method to profile physical evidence that is not visible to the naked eye and recovered only with a thorough microscopic investigation. Some examples of the types of physical evidence the TSW Trace™ method is employed are;

**BULLETS
METALS**

**PAINT
PLASTICS**

**GLASS
FIBRES**

RUBBERS

- **DRUGS AND PHARMACEUTICALS** - The TSW Trace™ method can be used to trace the origin (if relevant) of drugs. For example, the growing location of Marijuana or alternatively the batch of a particular recreational or pharmaceutical drug. The TSW Trace™ method can be used to verify the integrity of supply chains for pharmaceuticals, controlled substances or development of intelligence for illicit drug distribution.
- **FOOD AND FIBRE** - The TSW Trace™ determines the provenance (origin) of a food including its production system (e.g. Free Range vs. Cage Eggs). TSW Trace™ has been employed successfully to provide rapid traceability of meat (36 hours) back to farm of origin and has been employed routinely by the TSW Analytical Food Forensic team to complete food label compliance, and food substitution and adulteration investigations. Source Certain (www.sourcecertain.com) possesses an exclusive, global license for the application of TSW Trace™ method to food. Source Certain uses the TSW Trace™ method to verify the integrity of supply chains.

**SOURCE
CERTAIN**
FOOD ORIGIN SECURITY



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