

Background: A law enforcement agency requested assistance in obtaining a surreptitious DNA profile from a suspect who was unlikely to provide a voluntary sample or a ‘discarded’ sample. Upon consultation with the investigator, we devised a different approach based on our OneTouch™ DNA recovery and purification kit. Three laminated pages (8 x 11 in.) were produced and cleaned (10% bleach + UV irradiation 1 hour), placed inside UV-irradiated 3-ring binder and given to the investigator. The person of interest was interviewed and asked to page through the pictures, as if to obtain an identification. Following the suspect handling of the pages, the investigator returned the binder to the laboratory for screening and DNA processing.

Three Items of Evidence, Processed Individually

DNA Profile from Fingerprint:

1. Identification of latent print

Latent fingerprints were identified on the surface of the laminated pages using DNA-free black fingerprint powder.

2. Collection of identified fingerprint

Fingerprints were collected with a sterile cotton mini-swab moisten with 10 µL of detergent-based collection buffer and using the single swab ‘wet-dry’ collection technique.

3. Cell Lysis and DNA Extraction

The mini-swab was saturated with 50 µL lysis buffer and biological material collected using a spin-basket technique followed by cell lysis/DNA extraction at 56°C for 1 hour.

4. DNA purification on Xs column (subtractive purification)

The lysate was loaded on OneTouch™ Xs column and purified DNA was recovered by centrifugation at 8,000 RCF for 5 minutes.

5. Assessment quantity and quality of purified DNA

DNA quantity and quality was assessed by reduced volume DNA-STR analysis in a 6.25 µL PCR reaction followed by capillary electrophoresis, data analysis and comparison with amplification positive controls.

6. Concentration of purified DNA

The lysate was concentrated 3 fold by centrifugal vacuum concentration.

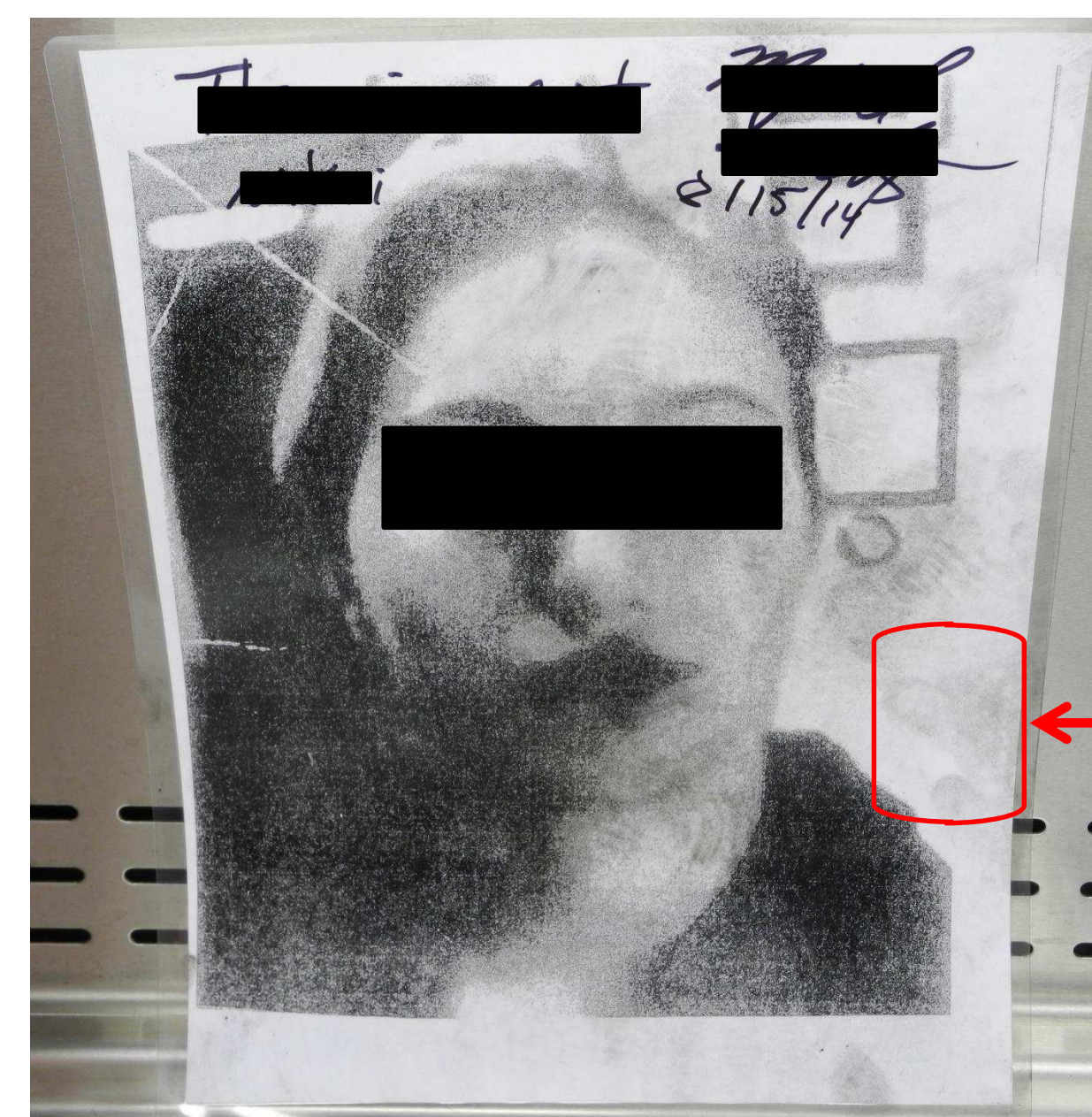
7. PCR amplification of concentrated DNA

Half volume (12.5 µL) PCR reactions were performed to generate DNA profiles.

8. Post-PCR concentration and purification

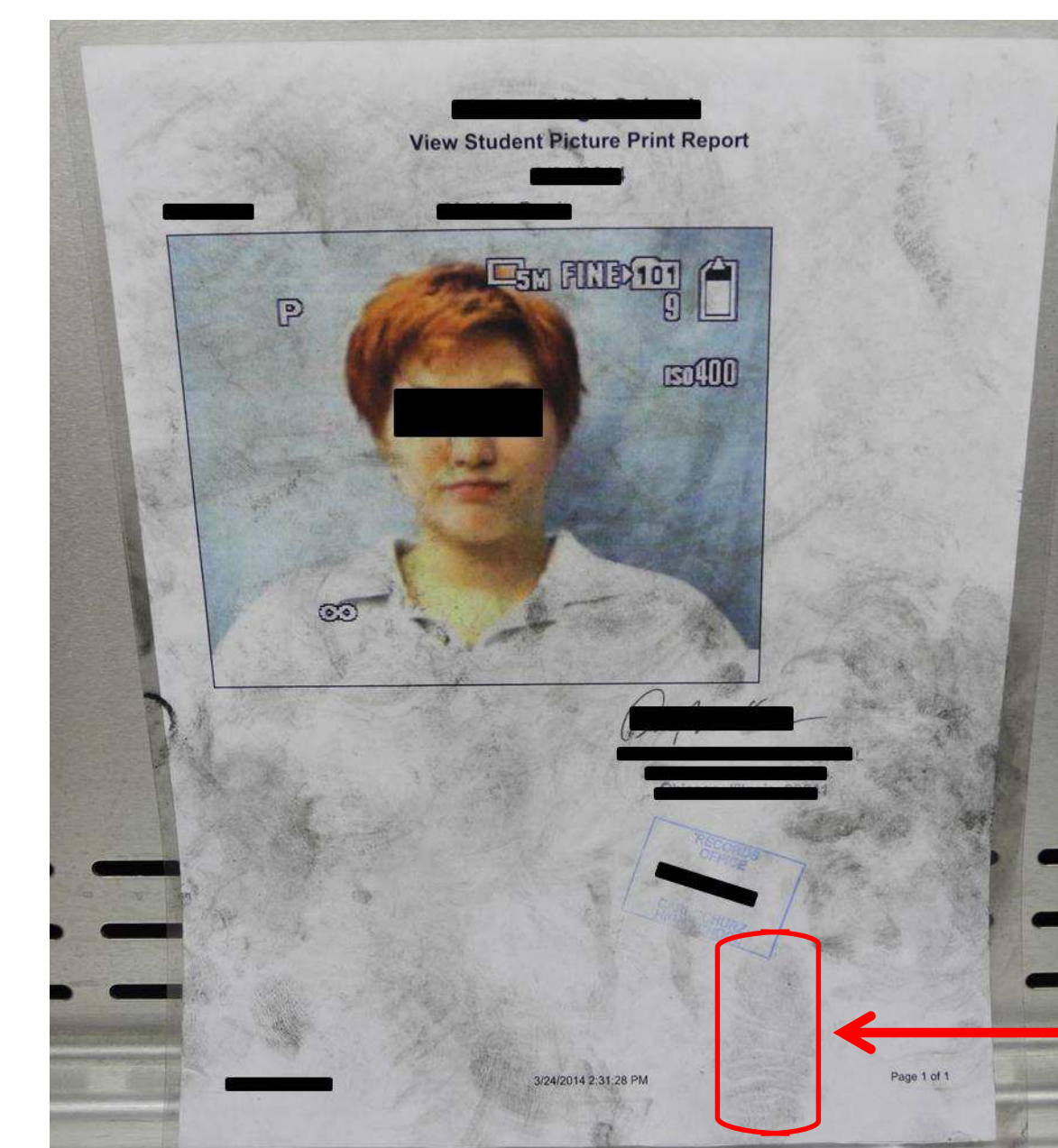
Due to the extremely limited amount of DNA on fingerprints, post-PCR purification and concentration (Amplicon Rx™) was used to increase the sensitivity of CE analysis.

Item #1 (laminated printed image)



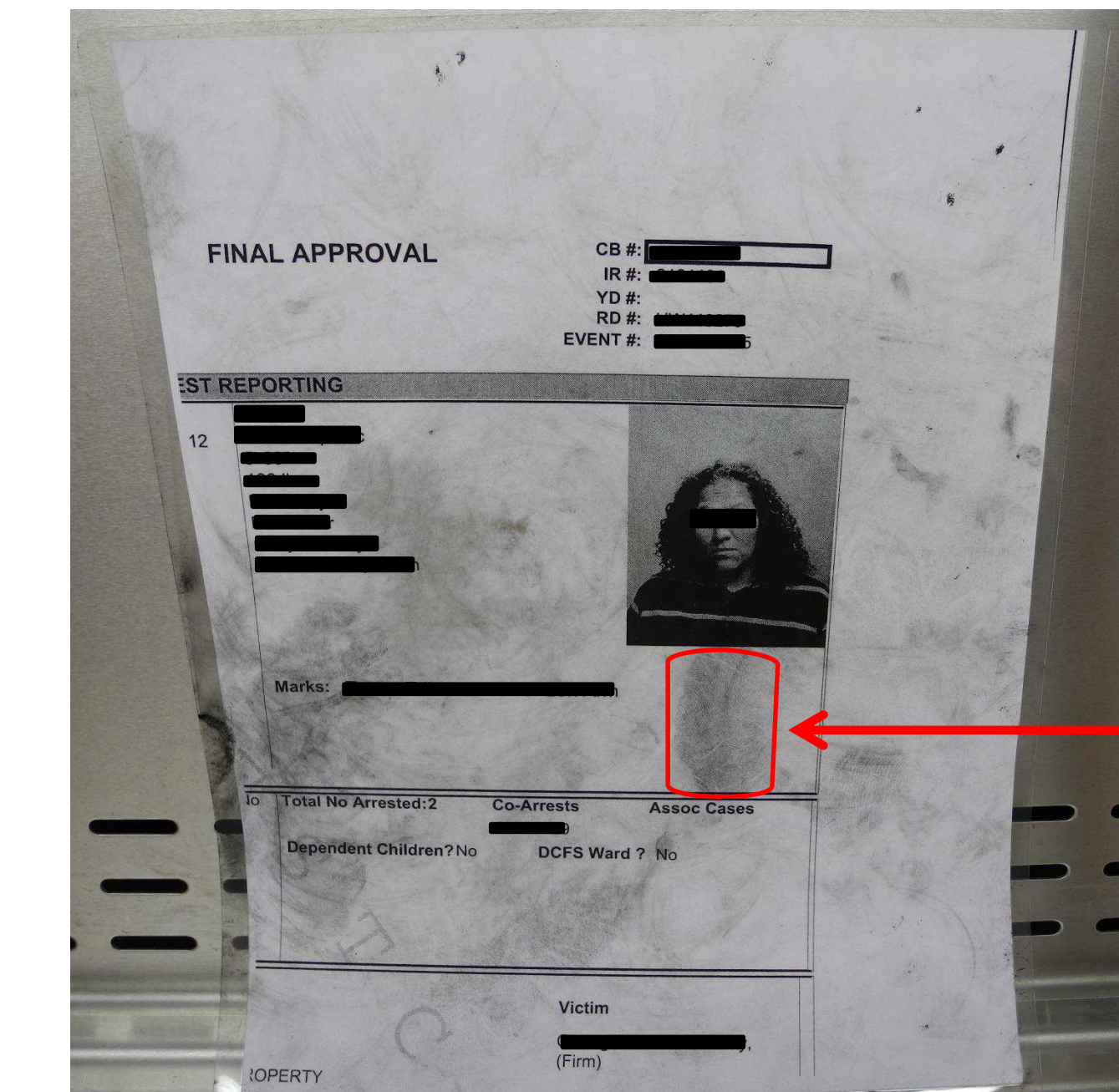
Fingerprints collected and processed for DNA

Item #2 (laminated print of a picture)



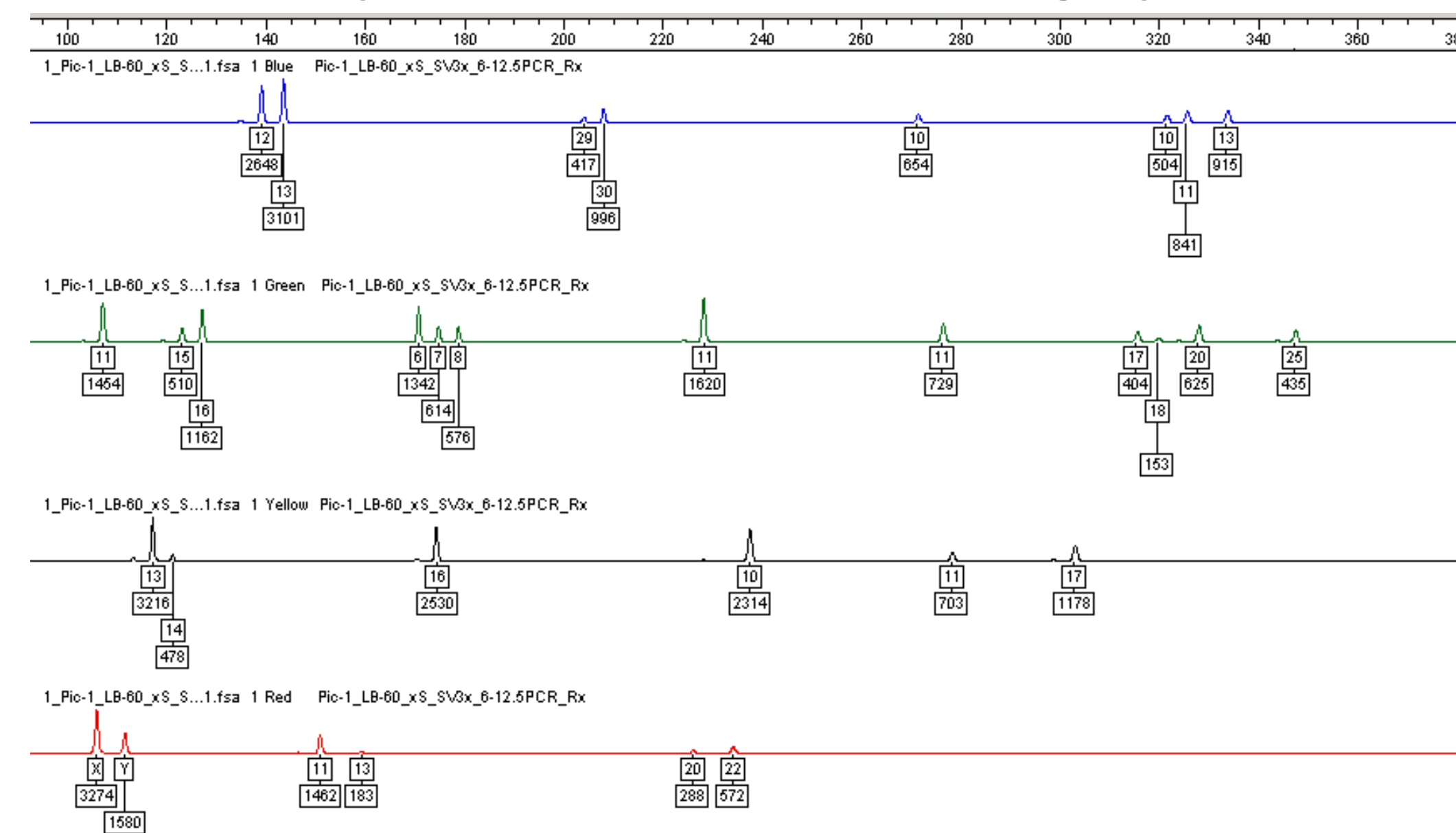
Fingerprint collected and processed for DNA

Item #3 (laminated copy of a criminal record)

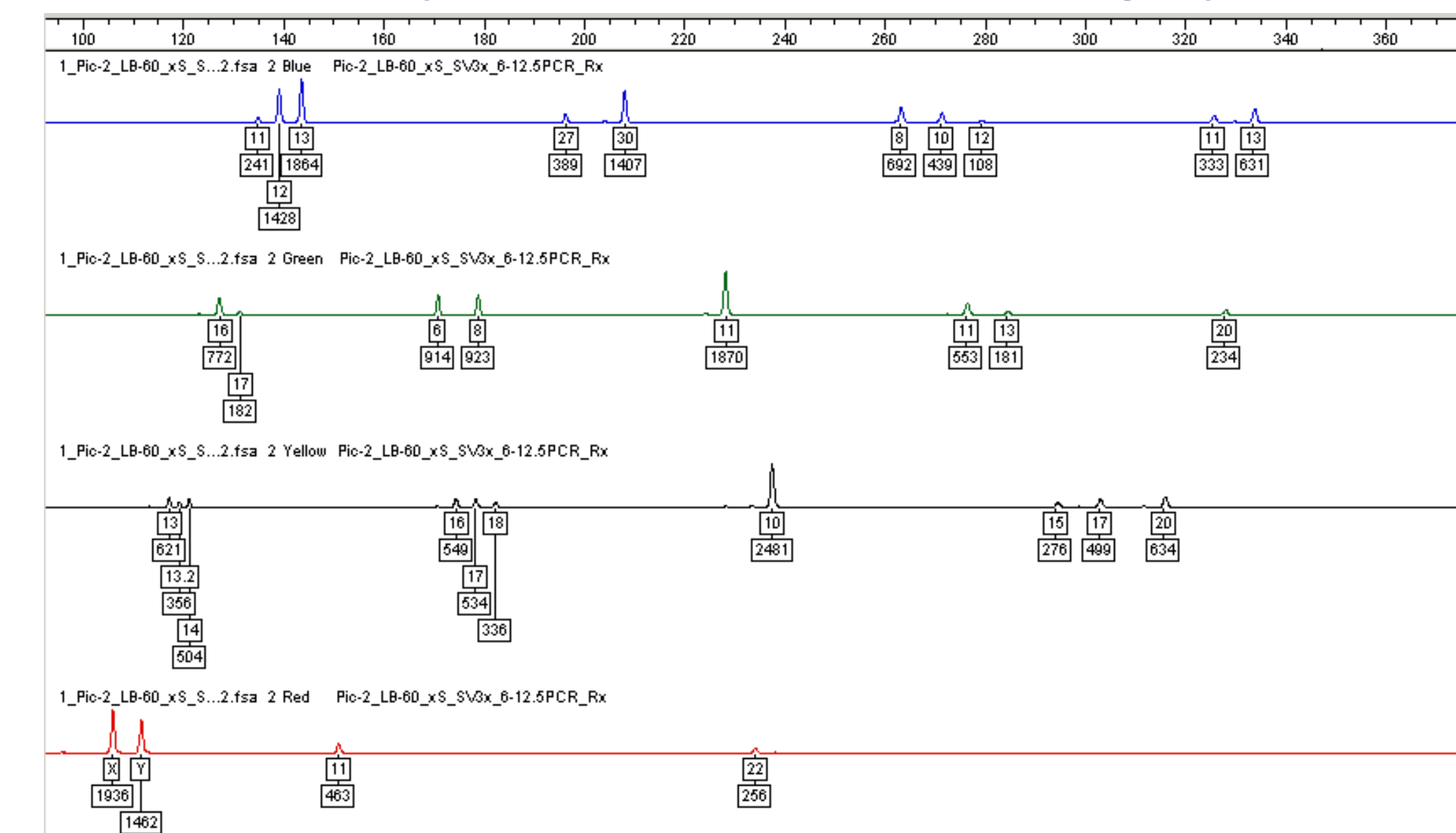


Fingerprint collected and processed for DNA

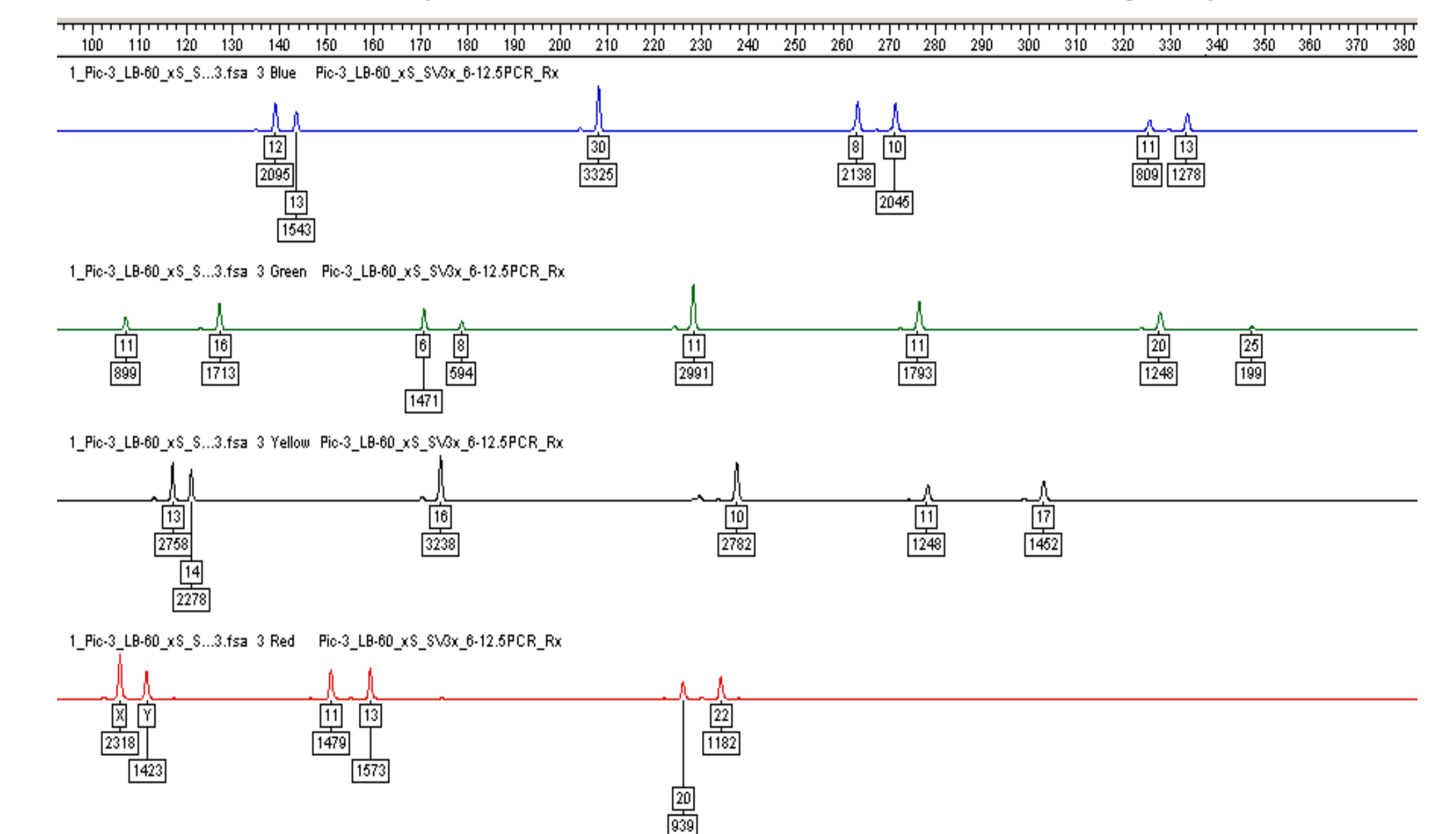
DNA profile from identified fingerprints



DNA profile from identified fingerprint



DNA profile from identified fingerprint



Fingerprints identified on Items 1 and 2 produced a mixed DNA-STR profile from two contributors. Fingerprint identified on Item #3 produced a complete single source DNA profile (Identifiler®). Mixed profiles from Items 1 and 2, share 82% and 69% of STR alleles with single source profile obtained from Item #3. Based on the profiles obtained from Items 1, 2 and 3, and elimination standard from investigator, the person of interest was **excluded** as a potential suspect in the ongoing criminal investigation.