Cause No. 27,181

THE STATE OF TEXAS	§	*IN THE DISTRICT COURT*
	§	*OF MIDLAND COUNTY,*
	§	*TEXAS*
vs.	§	
	§	*385TH JUDICIAL*
	§	*DISTRICT*
CLINTON LEE YOUNG	§	
	§	

DEFENDANT'S MOTION FOR AN ORDER AUTHORIZING RELEASE OF PHYSICAL EVIDENCE TO DEFENDANT'S COUNSEL OR COUNSEL'S DESIGNATED REPRESENTATIVE FOR PURPOSES OF HAVING THE EVIDENCE INDEPENDENTLY EXAMINED

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I. INTRODUCTION

Defendant Clinton Lee Young respectfully requests that this Court enter an order authorizing the release of a pair of gloves found at the scene of a 2001 murder for which he was sentenced to death in this Court, so that he can have the gloves independently tested for gunshot residue ("GSR") using scientific methods unavailable at his 2003 trial.[1] The gloves were entered into evidence at trial as state's exhibit 65. Though they were tested for lead before trial, they were not tested for GSR because law enforcement then lacked the proper equipment. In 2015, the gloves were tested for GSR using a Scanning Electron Microscope ("SEM"), and GSR was found to be present on both gloves in some undetermined amount. Young now seeks further SEM testing to determine the pattern of the GSR particles on the gloves, and their relative concentration on various areas of the gloves.

The pattern of GSR on the gloves is relevant to show Young's innocence of capital murder. Young has always contended that he did not shoot the second of the two victims in his case, Samuel Petrey, and that Mr. Petrey was actually shot and killed by Young's codefendant, David Page, while Page wore the gloves.[2] Young contends that he did not assist in the shooting and had no knowledge that it would occur. Because responsibility for Mr. Petrey's death was critical to Young's capital murder conviction, proof that Page actually killed Mr. Petrey without Young's assistance or participation would render Young innocent of that crime.

A pattern of GSR on the gloves suggesting a gunshot would implicate Page. Before trial, Page failed a polygraph test when he denied shooting Mr. Petrey. His trial testimony provided no explanation for how GSR could be on the gloves, let alone in a pattern suggesting a gunshot: Page claimed to have seen Young shoot both victims, but never claimed that Young wore the gloves during the shootings or that the gloves were ever worn by anyone else to shoot a gun. The gloves were brand new at the time of the crimes, such that any GSR could not have come from a prior shooting. DNA inside the gloves matched only Page, showing that no one else wore

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[1] In this motion, the term "gunshot residue" or "GSR" is used to refer to residues from gunshot primer. (*See* Ex. 1 (S. Palenik Decl.), ¶¶ 8-12.)

[2] Young also maintains that he did not shoot the first victim, Doyle Douglas. This motion, however, focuses on the facts surrounding Mr. Petrey's murder because that is the crime to which the requested GSR testing is relevant.

them. Since the crime, four people have provided sworn statements that they heard Page confess to shooting Mr. Petrey, and, in two of those confessions, Page said he shot Mr. Petrey while wearing gloves. New evidence also shows Page lied about the gloves' origins at trial: though he claimed at trial that he owned the gloves before the crimes and used them for yard work, microanalysis of the gloves' fibers in 2015 showed they were new, and lacked fiber wear or plant particles consistent with use in a garden. In 2015 Page finally admitted, in a notarized declaration, that he bought the gloves immediately before the crimes.

New testing demonstrates that GSR is present on the gloves. The state does not dispute these results. Rather, the state contends that the GSR resulted from cross-contamination with other objects instead of from the shooting of a firearm. To address that assertion, Young now seeks to test specific areas of the gloves—including the crux between the second and third fingers—for the presence of GSR and the GSR's concentration in those areas relative to other areas of the gloves. Because the proposed testing areas are normally not exposed unless the fingers are spread in a position similar to pulling a trigger, those areas are less likely to have GSR particles from cross-contamination. Instead, GSR between the second and third fingers would suggest that the gloves' wearer wore them when firing a gun.

Accordingly, if further testing shows a relatively high concentration of GSR in the areas Young seeks to test, the state's cross-contamination theory would be undermined and Young's allegation that Page wore the gloves to shoot Mr. Petrey, as he has admitted doing, would be substantiated. This information would exonerate Young and support his filing of a new habeas corpus petition under the recently-passed Article 11.073 of the Code of Criminal Procedure, which permits habeas relief based on newly-available scientific evidence. Young therefore requests that this Court grant access to the gloves and an in-court hearing on this request.

II. PROCEDURAL BACKGROUND

On April 11, 2003, Mr. Young was sentenced to death in this Court for the capital murders of Doyle Douglas and Samuel Petrey. The Texas Court of Criminal Appeals ("CCA") affirmed Young's conviction and sentence on direct appeal on September 28, 2005. *Young v. Texas*, 2005 WL 2374669 (Tex. Crim. App. Sept. 28, 2005). The Supreme Court denied certiorari on April 3, 2006. *Young v. Texas*, 547 U.S. 1056 (2006).

A. Initial Post-Conviction Litigation

On April 22, 2005, Mr. Young filed an application for writ of habeas corpus under Article 11.071 of the Texas Code of Criminal Procedure. The CCA denied that petition on December 20, 2006, and also dismissed as an abuse of the writ a set of supplemental claims filed by Young's counsel, which it construed "in toto" as a subsequent writ application. *Ex Parte Young*, 2006 WL 3735395 (Tex. Crim. App. Dec. 20, 2006).

In March 2009, Young filed a second subsequent writ application in state court asserting, *inter alia*, claims of prosecutorial misconduct under *Brady v. Maryland*, 373 U.S. 83 (1963) and *Napue v. Illinois*, 360 U.S. 264 (1959) based on evidence of undisclosed offers of leniency to two prosecution witnesses. This Court recommended denying relief on May 18, 2011, and the CCA denied relief on June 20, 2012. *Ex Parte Clinton Lee Young*, WR-65,137-03 (Tex. Crim. App. June 20, 2012). Young then litigated his claims in federal district court, which denied relief on February 10, 2014. *Young v. Stephens*, 2014 WL 509376 (W.D. Tex., Feb. 10, 2014). Young appealed to the Fifth Circuit, which affirmed. *Young v. Stephens*, 795 F.3d 484 (5th Cir. 2015). His certiorari petition to the United States Supreme Court was denied in March 2016. 136 S. Ct. 1453 (2016).

B. Subsequent Post-Conviction Investigation After The Conclusion of Federal Proceedings

Before his federal proceedings concluded in March 2016, Young had discovered the basis for new claims of innocence and false testimony at his trial. However, until March 2016 Texas's two-forum rule, *Ex Parte Soffar*, 143 S.W. 3d 804, 805 (Tex. Crim. App. 2004), precluded him from raising those claims in state court because he had federal litigation pending. He conducted preliminary testing on the gloves in 2015, however, and obtained sworn declarations from several witnesses who stated that they had heard Mr. Page confess to shooting Mr. Petrey.

When Young's federal litigation ended in March 2016, Young approached the Midland County District Attorney to request a stipulation to supplemental testing on the brown cotton gloves. Between May 2016 and April 2017 the parties negotiated over the further testing. Young's counsel met with the District Attorney and provided the District Attorney's office with his request for the testing and numerous items of newly-discovered evidence. The District Attorney's office carefully considered Young's request and evidence, as well as the trial record, and rejected Young's request to stipulate to the testing in April 2017. Young consequently files this motion for testing with the Court.

III. IF YOUNG DID NOT CAUSE, OR INTENTIONALLY ASSIST, MR. PETREY'S DEATH, HE IS INNOCENT OF CAPITAL MURDER

Young's capital murder conviction hinged on his responsibility for Mr. Petrey's murder. The state charged him with capital murder on two separate theories, each of which required him to have caused Mr. Petrey's death: (1) Young caused the deaths of Douglas and Petrey in different criminal transactions, but "pursuant to the same scheme and course of conduct," (Ex. 2 (1.CR.4-5) [Indictment].); and (2) Young caused Mr. Petrey's death in the course of committing kidnapping and robbery against Petrey. (*Id.*)[3] The jury convicted Young of capital murder under both theories. (Ex. 3 (5.CR.835-36)[guilt/innocence verdict forms].)

Under the instructions given at trial, Young could not be guilty of causing Mr. Petrey's death unless he actually shot Mr. Petrey or intentionally assisted someone else in doing so. Although Young was charged as both the actual shooter and as a non-shooter party under Texas's Law of Parties, his jury was instructed only under Law of Parties section 7.02(a)(2), which requires that a non-shooter party have acted "with the intent to promote or assist the commission of the offense" and actually provided encouragement, direction, or aid, or attempted to aid, the actual killer. (Ex. 4 (5 CR 813-14)[jury instructions].) Section 7.02(b), which permits a party to be guilty as a co-conspirator for crimes committed in the course of the conspiracy, was not charged. Indeed, the jury was specifically instructed that "[m]ere presence alone will not constitute one a party to an offense." (*Id.*) Pursuant to the jury instructions, and because the state presented no evidence that Young intentionally assisted Page in shooting Mr. Petrey—its

[3] Although the jury was also instructed that it could find Young guilty as a party to Petrey's murder if he aided in that murder with intent to promote or assist it, the state's theory did not contemplate this possibility. The only evidence regarding what happened during the Petrey shooting—the testimony of David Page—was that Young was Petrey's actual kidnapper and shooter.

only evidence was that Young was the actual shooter—Mr. Young could not be guilty of capital murder unless he actually shot Mr. Petrey.

IV. DAVID PAGE'S ACCOUNT OF THE PETREY SHOOTING—THE ONLY EVIDENCE USED TO CONVICT YOUNG—IS UNRELIABLE AND INCREDIBLE

The state's theory at trial was that Young was the actual shooter of both victims. Its case rested almost entirely on the testimony of three accomplices—Mark Ray, David Page, and Darnell McCoy—who were close friends of each other but not of Young.[4] The accomplices claimed that Young masterminded both killings, shot both victims, and forced them at gunpoint to assist him in the crimes even though they themselves were armed with loaded weapons.[5]

Page, Ray, and McCoy testified that they were with Young at a fishing lodge in East Texas on the night of November 24, 2001. Late that night, they departed with Young and Mr. Douglas, in Mr. Douglas's car to buy marijuana at a drug house in Longview, Texas. As they sat in the car at the drug house, the accomplices testified, Young suddenly pulled out a semiautomatic pistol and shot Mr. Douglas twice in the head. Then, they testified, Young forced them to help him deposit Douglas's body in the woods, forced Ray to shoot Douglas a third time as he lay in the woods in a creek, dropped off Ray and McCoy at their homes, and departed with Page in Douglas's car for Midland, Texas. (*See* 21 RR 98-137; 22 RR 66-177; 26 RR 150-191.)

Page, the only companion remaining with Young, provided the only testimony about how Mr. Petrey was apprehended and shot. Not surprisingly, he blamed Young. Page testified that he and Young spent the day of November 25, 2001 driving in Douglas's car towards Midland. Towards evening, Page testified, Young decided they needed to obtain a new car and—to do so—abducted Petrey in a grocery store parking lot in Eastland. Page testified that he and Young carjacked Petrey, departed in Petrey's vehicle with Petrey inside, abandoned Douglas's car in a

[4] McCoy was close friends with Ray, (21 RR 144), was Page's cousin by marriage, and lived with Page, (21 RR 87,143-44), but didn't know Young as well. (21 RR 145). Ray testified that Page was his best friend, and that McCoy was Page's brother in law by marriage, but he was not close with Young. (22 RR 152, 154.)

[5] Ray had a .22 revolver, and McCoy had a .38. (21 RR 133, 182-89 (McCoy); 26 RR 167-69, 174; 27 RR 135-36, 175-76 (Page).)

brush area by the highway and proceeded to Midland with Petrey in Petrey's truck, Page driving much of the way while Young slept. The next morning, according to Page, they drove to an oil pump site where Young shot and killed Petrey outside the truck. (26 RR 191-249.)

Page's account of Perey's killing was always incredible. Before Young's trial, Page failed a polygraph test when he denied shooting Mr. Petrey. (27.RR.239-41; Ex. 5 [Page polygraph test report].) At trial, Page gave shifting accounts of the crime that contradicted both the physical evidence and his own prior statements. Though he had initially told law enforcement that Young shot Petrey in the right side of the head, he testified at trial that it was the left (27 RR 42-44), then changed his testimony mid-trial and denied having seen the shooting at all. (27 RR 94-95, 208-10.) Page also changed his account of where Petrey was facing when shot, (27 RR 209-212), and contradicted the physical evidence: he testified that Young shot Petrey from six to ten feet away (27 RR 42), but soot and stippling on Petrey's skin indicated a range of just six inches to two feet. (26 RR 27-31, 34-36.) Page even admitted he had changed his description of Petrey's shooting after law enforcement prompted him on the facts by telling him that Petrey was shot in the left of the head and not the right. (27 RR 43-44.) And although Page insisted he had only helped Young kidnap Petrey under duress, he was forced to admit he had passed up numerous opportunities to escape. He drove Mr. Petrey's truck for hours while Young slept, without ever attempting to knock Young unconscious or drive to a safe location. (26 RR 216-18.) At another point, Young left Page alone in Mr. Petrey's truck with the car keys and Mr. Petrey for over ten minutes while Young shopped inside a 7-Eleven store, but Page made no attempt to drive away.[6] (24 RR 216-18, 275-79; 26 RR 223-24; 27 RR 166 (Page); 27 RR 293-95 (Spencer).) Page also used the restroom alone with Mr. Petrey at a rest stop and waited with Mr. Petrey alone in a Wal-Mart while Young used the restroom, without making any attempt to escape or seek help. (26 RR 219-20; 27 RR 34-35, 82-83.)

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[6] A 7-Eleven surveillance video captured this event, but the state represented at trial that the video had been lost so it could not be played for the jury. (24 RR 232-33 (Spencer); 29 RT 20-21 (Schorre).) Though law enforcement testified about the tape, they appear to have misdescribed its contents: an officer testified that the video showed Young wearing "extremely white" tennis shoes (24 RR 218)—which the prosecution claimed Young stole from a Wal-Mart store in Odessa (*see* 26 RR 13-15 (Reed), 224-25 (Page))—but Page testified that he and Young did not even go to Odessa until after they had already been to the 7-Eleven. (26 RR 221-25).

A pair of gloves found near Petrey's body—which Page admitted were his—had only Page's DNA on the inside and traces of lead on the outside that a trial expert testified *could indicate* GSR. (25.RR.169-72; 26.RR.241-42; 27.RR.256-57.) The gloves were not tested for GSR before trial, however. Instead, the state tested them only for lead (one of the three components of gunshot residue) using a "sodium rhodizonate" test. (25 RR 169.) Although lead traces were found on the gloves, that result did not necessarily prove GSR was present because lead can come from other sources. (Ex. 1 (S. Palenik Decl.) ¶ 35; 25 RR 183-87.) The pattern of lead on the gloves was suggestive of a shooting, however: the lead was located on the middle back of the left glove, a small spot on the edge, and two small spots on the inner seam of the thumb and forefinger, on the "press out"—areas where GSR might lodge during the shooting of a firearm. (25.RR.172, 182-83; *see also* Ex. 6, [T. Counce Notes, "GSR Worksheet Item #15, page 5].)

V. NEWLY-OBTAINED EVIDENCE FURTHER IMPLICATES PAGE IN MR. PETREY'S SHOOTING

Since 2001, evidence of Page's guilt has continued to mount. At least four people have now provided sworn statements that they heard Page confess to Mr. Petrey's shooting. (27.RR.271-75; Ex. 7 (R. Villa 2003 Decl.) ¶¶ 1-6; Ex. 8 (R. Villa 2008 Decl.); Ex. 9 (J. Kemp Decl.) ¶¶ 7-8; Ex. 10 (J. Hutchinson Decl.) ¶¶ 1-5.) In two of those confessions, Page admitted shooting Petrey while wearing gloves. (27.RR.271-75 (McElwee testimony); Ex. 9 (J. Kemp Decl.) ¶7.) Christopher McElwee, a fellow inmate of Page, testified at trial that Page told him he had shot Petrey while wearing a pair of gloves, and that Page said the gloves were the reason Page had no "powder burn" on his hands. (27 RR 274-75.) McElwee's testimony appears credible, because Page himself used the phrase "powder burns" during his trial testimony while attempting to exculpate himself, saying "How can I be the shooter [of Mr. Petrey] with no powder burns on my hands?" (27 RR 210).

Another fellow inmate, Raynaldo Villa, stated in a post-trial declaration in April 2003 that "Page told me that he killed Petrey but was pinning it on Young because he, Page, did not want to get life in prison." (Ex. 7 (R. Villa 2003 Decl.).)[7] Villa reiterated this statement in a second declaration in September 2008, stating that Page told him "that he, and not Clinton Young, had shot Petrey outside of Petrey's truck." (Ex. 8 (R. Villa 2008 Decl.) ¶ 4.)

In 2010, two more witnesses heard Page make similar confessions. James Kemp, an inmate housed with Page at the Midland County jail, heard Page talking through the ventilation system with another inmate. (Ex. 9 (J. Kemp Decl.) ¶¶ 5-6.) Kemp heard Page say "police never found fingerprints on the gun used in [Petrey's] shooting because Page had worn gloves the night it occurred." (*Id.*, ¶ 7.) Page said he wasn't angry at receiving a long prison sentence from the crime "because if only the police knew what really had happened, he might have been facing capital murder." (*Id.*, ¶ 8.) Another inmate, John Hutchinson, was also at the jail and heard Page "bragging" through the air vents "about how he had shot and killed [Petrey]" by shooting him twice in the head with a .22 caliber handgun. (Ex. 10 (J. Hutchinson Decl.) ¶¶ 2-3.)[8]

In 2015, Young's counsel had the gloves tested for GSR using a method called Scanning Electron Microscopy ("SEM"). Unlike the lead testing conducted at trial, SEM testing conclusively detects GSR by identifying the unique combination and spherical arrangement of elements—lead, antimony, and barium—that comprise GSR. In the 2015 testing, GSR was found on both gloves. (Ex. 11 (2015 Microtrace, LLC Report).) That testing, however, did not attempt to determine the total number of GSR particles on the gloves, or their relative concentration on various areas of the gloves. (Ex. 12 (C. Palenik, Ph.D. Decl.) ¶ 7.) It "provide[d] results only in terms of presence or absence" of GSR. (*Id.* ¶ 9.)[9]

The 2015 testing not only showed GSR on the gloves; it also confirmed that Page had lied at trial about the gloves' origins. Page testified at trial that the gloves were his work gloves, that he owned them before the Douglas and Petrey murders, and that he had used them the day before the murder to perform yard work including moving tree limbs and scrap metal. (26 RR

[7] Villa's affidavit was filed by Young's counsel in support of Young's motion for a new trial. (5 CR 910.)

[8] Mr. Petrey did, indeed, have two bullet holes in his head. (26 RR 27 (Townsend-Parchman).)

[9] Pursuant to laboratory protocol, the SEM microscope was scanned over the gloves until a requisite number of GSR particles—three—was detected, and then testing stopped. (Ex. 12 (C. Palenik, Ph.D. Decl.) ¶ 8.)

137.) He denied having bought them at a mini-mart the night Doyle Douglas was killed. (26 RR 241.) The 2015 testing, however, showed that the gloves were new and had not been used for yard work: the fibers on the palm area were not compressed any more than the fibers on the backs of the gloves, and they contained no traces of plant material or metal particles that would have indicated their use for yard work such as Page described in his testimony. (Ex. 11 (2015 Microtrace, LLC Report) at 1-2.) Consistent with those tests, Page admitted in a 2015 declaration that he in fact bought the gloves new at a mini-mart the night Douglas was killed, such that any GSR on the gloves could not have come from any prior shooting. (Ex. 13 (D. Page Decl.) ¶ 20.)[10] Page's 2015 declaration and the 2015 GSR testing demonstrate that any GSR on the gloves is the result of the events the night of the Petrey shooting, rather than from prior shootings as the prosecution implied.

After learning the results of the 2015 testing, counsel for the state asserted that the GSR on the gloves was not probative because it merely resulted from cross-contamination from contact between the gloves and other objects that contained GSR. While Young believes that the presence of GSR on the gloves in any amount is probative, he wishes to address the state's cross-contamination theory by conducting supplemental testing to see whether the GSR is concentrated in an area of the gloves that would suggest they were worn by the shooter of a firearm. GSR deposited by the discharge of a weapon would likely be unevenly distributed on the glove—that is, higher concentrations would be deposited in areas exposed during discharge, while lower concentrations would be deposited in areas that are shielded during discharge. By contrast, GSR deposited by cross-contamination would be more evenly deposited on the exposed surfaces of the gloves. (Ex. 12 (C. Palenik, Ph.D. Decl.) ¶ 12.)

Further testing is needed to determine whether GSR is concentrated on the gloves in an area that would be exposed during discharge, but otherwise normally shielded from contact with other objects, such as the crux between the second and third fingers. Such a pattern of GSR on the gloves, in conjunction with Page's admissions and failed polygraph test, would indicate that Page was Petrey's actual shooter. It would also significantly discredit the only evidence

[10] Page also admitted he had lied at trial when he claimed Young had expressed an intent to harm Petrey; Page admitted in his 2015 declaration that Young made no such statements. (*Compare* 26 RR 207 *with* Ex. 13, (D. Page Decl.) ¶ 17.)

presented at trial—Page's testimony—that suggested Young either shot Petrey or intended for him to be killed.

VI. REQUEST FOR RELEASE OF EVIDENCE FOR FORENSIC ANALYSIS

New scientific methods, which were not reasonably available during Young's trial, now permit GSR particles to be detected more reliably on cloth items like gloves. Texas recently created a legal vehicle, Code of Criminal Procedure article 11.073, for courts to consider such new scientific evidence in a successor post-conviction application. Release of the gloves is therefore warranted so that Mr. Young can subject them to the newly-available testing methods.

A. Effective September 1, 2013, Texas Code of Criminal Procedure Article 11.073 Permits Prisoners to Challenge Their Convictions Based on Newly-Available Scientific Evidence

On June 14, 2013, the Governor of Texas signed SB 344, which established new Article 11.073 to the Code of Criminal Procedure. Article 11.073, which took effect on September 1, 2013, permits prisoners to challenge their convictions based on "relevant scientific evidence" that "was not available to be offered by a convicted person at the convicted person's trial." Tex. Code Crim. P. art. 11.073 §(a)(1); *see also* Senate Bill 344 at § 3 (setting out effective date of September 1, 2013, for the Act). The purpose of this provision is to "fill a gap in habeas corpus law [by] ensur[ing] that the law ke[eps] pace with science, and provide a path for relief where false and discredited forensics may have caused the false conviction of an innocent person." S.B. 344 House Research Organization Bill Analysis at 3.[11]

Article 11.073 permits courts to "grant a convicted person relief on an application for a writ of habeas corpus if" the person files an application in the manner provided in Article 11.071 of the Texas Code of Criminal Procedure, which contains "specific facts indicating that:"

> (A) relevant scientific evidence is currently available and was not available at the time of the convicted person's trial because the evidence was not ascertainable through the exercise of reasonable

[11] The text of the bill analysis, as well as the Act, is available at http://www.capitol.state.tx.us/BillLookup/Text.aspx?LegSess=83R&Bill=SB344#, last visited on April 19, 2017.

> diligence by the convicted person before the date of or during the convicted person's trial; and
>
> (B) the scientific evidence would be admissible under the Texas Rules of Evidence at a trial held on the date of the application . . . .

Tex. Code Crim. P. art. 11.073, § (b)(l)(A)-(B). The court must also find "that, had the scientific evidence been presented at trial, on the preponderance of the evidence the person would not have been convicted." *Id.* at § (b)(2).

Article 11.073 permits a court to grant habeas corpus relief based on newly available scientific evidence even if the claimant has previously filed an application for a writ of habeas corpus under Article 11.071. Even when the application is based on scientific evidence that, though unavailable during trial, has not changed since the filing of the previous application, article 11.073 still permits a claimant to proceed if the prior application pre-dated SB 344's effective date of September 1, 2013. *Ex Parte Robbins*, 478 S.W. 3d 678, 689-90 (Tex. Crim. App. 2014), *rehearing denied January 27, 2016*. In such situations, the 2013 passage of SB 344 provides a new legal basis so as to permit merits consideration under article 11.071 section 5(a)(1). *Id.* at 690. "Prior to the enactment of article 11.073, newly available scientific evidence *per se* generally was not recognized as a basis for habeas corpus relief and could not have been reasonably formulated from a final decision of [the CCA] or the United States Supreme Court, unless it supported a claim of 'actual innocence' or 'false testimony.'" *Robbins*, 478 S.W.3d at 689. Article 11.073 therefore "provides a new legal basis for habeas relief in the small number of cases where the applicant can show by the preponderance of the evidence that he or she would not have been convicted if the newly available scientific evidence had been presented at trial." *Id.* at 690.

Here, Mr. Young's previously filed a habeas corpus application with the CCA in March 2009, over four years before the effective date of Article 11.073. Consequently, any future application by Mr. Young under article 11.073 based on the results of GSR testing on the gloves would be supported by a new "legal basis [that] was unavailable on the date [Mr. Young] filed the previous application." Tex. Code Crim. P. art. 11.071 § 5(a)(1).

B. Since Mr. Young's 2003 Trial, There has Been a Significant Evolution in Methods of Extracting Gunshot Primer Residue on Cloth Items

The SEM testing Young requests through this motion was not reasonably available to him at the time of his 2003 trial. Although SEM testing existed in 2003, there was no reliable and generally-accepted way to extract particles of GSR from cloth fibers so they could be tested. (Ex. 1 (S. Palenik Decl.) ¶¶ 22-23.) Indeed, the Texas Department of Public Safety ("DPS") did not have the ability in 2003 to perform SEM tests on cloth items, and DPS manuals from the 2001-2003 time period show that DPS lacked the ability to conduct SEM testing *at all* before Young's trial.[12] DPS firearms expert Tim Counce testified at trial that DPS "do[es]n't perform [GSR] analysis on gloves per se, but on hands." (25 RR 187-88.) The Midland County Sherriff's Department ("MCSO") also lacked SEM testing capability: MCSO investigator Paul Hallmark, who handled evidence collection, described SEM testing methods as involving collection of evidence from skin, not cloth, and stated that the MCSO simply did not have access to SEM testing in 2001. (25 RR 18) (Q: "Back on November 26, 2001, did you have access to a gunshot residue test? A: Only the atomic absorption test, not the Scanning Electron Microscopy.")

Even if DPS and Midland law enforcement had had SEM technology in 2003, they likely would not have been able to use it to determine the relative concentration of GSR particles on various areas of the gloves. This is because no reliable means existed in 2003 of extracting GSR particles from cloth fibers. (Ex. 1 (S. Palenik Decl.) ¶ 22.) Without some means of removing

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[12] DPS manuals from the 2001-2003 time period show that until July 2003—several months after Young's trial ended—the agency used only "Atomic Emission Spectroscopy" ("AAS") to test for gunshot primer residue, and even this procedure was used only for "hand swabs," not clothing. (Ex. 14 (DPS Manual TE-GSR-2003-0701-2003-1201) at 1.) DPS did not begin using SEM technology until July 1, 2003, three month after Young's trial concluded. (*Id.*, Standard Operating Procedures at 1, Effective Date July 1, 2003.) DPS manuals acknowledged that Atomic Emission Spectroscopy testing, unlike the later-adopted SEM/EDS testing, could not definitively show whether or not gunshot residue was present. The manual states, "[t]he presence of significantly elevated levels of antimony, barium, and lead are highly indicative of, *but not specific to*, primer gunshot residue." (*Id.*, Standard Operating Procedures: Trace Evidence, at 1)(emphasis added).) AAS testing cannot definitively identify gunshot primer residue because it cannot determine the shape of the relevant particles, only their elemental composition. (Ex. 1 (S. Palenik Decl.) ¶¶ 19-21.)

the GSR particles from the fibers, it is virtually impossible to test for their presence. (*Id.*, ¶ 23.) GSR particles are extremely small compared to cloth fibers, and can hide on the undersides of the fibers so as to be invisible to the microscope. (*Id.*, ¶ 24.) The fibers themselves cannot be viewed under the microscope, both because the GSR particles may hide under the fibers and because the fibers interfere with the microscope's operation by electrically charging. (*Id.*) Though law enforcement generally used sticky tabs to attempt to extract GSR particles from cloth in 2003 (*id.*, ¶ 24), that method is ineffective because the cloth fibers typically come off on the tape along with the particles. (*Id.*) Because of the lack of methods for removing GSR from cloth, there was no reliable and commonly accepted method in 2003 to examine clothing for GSR using SEM technology. (*Id.*)

But that has now changed. Since the early 2000s, scientists have been developing new and more reliable methods for extracting GSR particles from cloth. (*Id.*, ¶ 25.) One new method involves the use of ultrasonics. (*Id.*) The ultrasonic method involves cutting out a piece of the cloth to be tested, placing it into a centrifuge tube, and passing ultrasonic waves through the cloth so that the GSR particles fall to the bottom of the centrifuge. (*Id.*) The particles can then be extracted and examined by SEM to determine whether they have the spherical shape and elemental composition characteristic of GSR. (*Id.*) If this Court grants Young's motion for release of the gloves, Young's expert will use this method to extract particles of GSR from the cloth fiber and then examine them under an SEM. (Ex. 12, C. Palenik, Ph.D. Decl., ¶ 14.)

C. Mr. Young Requests that this Court Authorize the Release of the Gloves to his Authorized Representative So that that they can be Tested for Relative Concentrations of GSR

To address the state's claim that the GSR on Page's gloves resulted from cross-contamination, Mr. Young wishes to test for GSR in an area of the gloves—the crux between the second and third fingers—that would not normally be exposed to contact with other objects, but would be exposed if the gloves were worn by the shooter of a firearm. If GSR is found in that location in a relatively high concentration, that finding would suggest the GSR was deposited when the gloves were worn to shoot a gun. Because Page admitted the gloves were his, only Page's DNA is inside the gloves, Page has admitted he bought the gloves the night Douglas was killed, and Page did not provide any innocent explanation for the presence of GSR on the gloves, a concentration of GSR between the second and third fingers would corroborate other evidence that Page was the shooter of Samuel Petrey.

To perform the proposed testing, Mr. Young respectfully requests that this Court order that the gloves be released to his counsel, or to his designated representative, Dr. Chris Palenik, Microtrace, 790 Fletcher Drive, Suite 106, Elgin, Illinois, 60123-4755, (847) 742-9909. Dr. Palenik proposes to analyze the concentration of GSR particles in the following areas of the gloves:

Palenik Proposed Testing (*see* Declaration at ¶ 13)	
Area of Glove	**Basis for Testing**
Area A: The area of the gloves between the second (index) and third fingers.	Due to the bulky nature of the gloves (see Figures 2 and 3 of the 2015 Microtrace report), this area is relatively protected and would be unlikely to be exposed to cross-contamination if the gloves were lying on a surface or worn while performing many ordinary tasks. However, if a glove was worn on a hand used to discharge a firearm, the area between the second and third fingers would be exposed during the trigger operation and subject to the possible deposition of the GSR during the discharge event.
Area B: The area between the third and fourth fingers.	This area would be relatively protected both a) if the gloves were lying on a surface or used for many ordinary tasks and b) if the glove was worn on a hand used to discharge a firearm. This area would serve as a negative control.
Areas C & D: The back side (area C) and the palm side (area D) of the ring finger of the glove.	These areas, not previously sampled in the 2015 analysis, would provide comparison samples to which the Area A samples would be compared.

To conduct the analysis, Dr. Palenik proposes the following approach:

1. On each glove, excise a one-centimeter area from each of the four glove surfaces noted above (a total of eight samples).

2. Particles (including GSR) would be isolated from each sample using the sonication method described in the July 21, 2015 Microtrace report.

3. The collected particles would be analyzed using an automated GSR routine by SEM/EDS to determine the total number of GSR particles at each location.

4. The results from each location would be summarized and compared to form conclusions.

(Ex. 12, C. Palenik, Ph.D. Decl., ¶ 14.) Dr. Palenik states that this testing would take approximately three weeks from the time that funding is authorized and the gloves are received by Microtrace. (*Id.*, ¶ 15.)

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VII. CONCLUSION

Newly-available scientific methods for extracting and detecting GSR could permit Young to show his innocence of capital murder. New article 11.073 would permit Mr. Young to bring that claim in a new application for habeas corpus relief. Mr. Young therefore requests that this Court order the release of state's trial exhibit 65, one pair of brown gloves, to his designated representatives for forensic analysis, and grant a hearing on this request.

Respectfully submitted,

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Margo A. Rocconi (California Bar No. 156805)
Joseph A. Trigilio (California Bar No. 245373)
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Dated: April 27, 2017

By Margaret A. Farrand

Margaret A. Farrand
Attorneys for Defendant,
Clinton Lee Young

<u>List of Exhibits, Defendant's Motion for an Order Authorizing Release of Physical Evidence</u>
***<u>State of Texas v. Clinton Lee Young</u>*, <u>Midland County District Court, 238th Judicial District,</u>**
<u>Case No. 27,181</u>

Exhibit Number	**Description**
1	Declaration of Samuel Palenik (April 2, 2015)
2	Indictment, *Texas v. Clinton Lee Young*
3	Verdict Forms, Guilt Innocence, *Texas v. Clinton Lee Young*
4	Excerpts of Jury Instructions, *Texas v. Clinton Lee Young*
5	Polygraph Report re. David Page, San Angelo Police Department, re. David Page (February 25, 2002)
6	Texas Department of Public Safety GSR Worksheet, L-295756, Examiner Tim Counce
7	Declaration of R.R. Villa (April 25, 2003)
8	Declaration of Raynaldo Ray Villa (September 23, 2008)
9	Declaration of James Kemp (February 23, 2014)
10	Declaration of John Hutchinson (February 24, 2014)
11	GSR Testing Report, Microtrace, LLC (July 21, 2015)
12	Declaration of Christopher S. Palenik, Ph.D. (January 13, 2017)
13	Declaration of David Page (August 20, 2015)
14	Evidence Testing Procedures Manual, Texas Department of Public Safety, TE-GSR-2003-0701-2003-1201

EXHIBIT
1

DECLARATION OF SAMUEL PALENIK

1. I, Samuel ("Skip") Palenik, do hereby declare the following to be true and correct, under penalty of perjury.

I. CREDENTIALS

2. My credentials are laid out in depth in my current curriculum vitae ("c.v.") and resume, a true and correct copy of which are attached to this declaration as Exhibit A.

II. PURPOSE OF THIS DECLARATION

3. I have been retained by federal habeas corpus counsel for Clinton Lee Young to provide a declaration describing changes in methods of collecting gunshot residue from cloth fibers that have come about since Mr. Young's capital murder trial in 2003.

4. I understand that this declaration is to be submitted by Mr. Young's federal habeas counsel in support of a motion to obtain release of a pair of gloves that were entered into evidence at Mr. Young's 2003 trial. I also understand that the purpose of obtaining access to these gloves would be to analyze them for the presence of gunshot residue.

III. EVIDENCE REVIEWED

5. I have reviewed the following evidence related to Mr. Young's case: a copy of the opinion issued by the Texas Court of Criminal Appeals in Young *v. State*, 2005 WL 2374669 (Tex. Crim. App. Sept. 28, 2005), excerpts of the trial testimony of Tim Counce, Christopher McElwee, Gregory Kent Spencer, David Page, and Paul Hallmark, the entire trial testimony of Maurice Padilla, Caroline Van Winkle and Cassie Carradine, and a report dated November 20, 2002 by Tim Counce, in which Mr. Counce set forth the results of his examination of various pieces of evidence introduced at Mr. Young's trial.

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IV. COMPONENTS OF AMMUNITION CARTRIDGES

6. Ammunition cartridges (also called "rounds" or "shells") consist of four major components: the shell case (or metal covering that goes around the bullet), the bullet itself, the primer, and the powder.

7. The primer is a shock-sensitive explosive that ignites when the gun is fired. The powder (also called "propellant") fills the inside of the cartridge, and sits under the bullet. When the gun is fired, a hammer or firing pin hits the primer and causes it to ignite. The primer explodes, and the flame from that explosion ignites the gunpowder. The explosion of the gunpowder, and resulting pressure from the gases released, ejects the bullet from the gun. This entire process happens almost instantaneously.

V. TWO MEANINGS OF "GUNSHOT RESIDUE"

8. In this section, I will explain two commonly-used definitions of the term "gunshot residue," and specify which of those two definitions I am using in this report.

9. "Gunshot residue" is a term that is commonly used to mean at least two different things. The differences in these two meanings are significant.

10. First, it is sometimes used to refer to burns from the flame from the muzzle of the weapon and/or residues of unburned or partially burned propellant, that appear on clothing as a result of a close-range shot. These are also called "powder burns." In the case of slightly longer-range shots, there may be no powder burns but instead particles of unburned or partially burned powder may stick to the material.

11. Second, the term "gunshot residue" is sometimes used to refer instead to residues of gunshot *primer*.

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12. In this declaration, I will use the term "gunshot residue" in the second sense, to refer to residue from gunshot primer. Consequently, I will use the term "gunshot primer residue" or GPR in this declaration.

VI. THE CHARACTERISTICS OF GUNSHOT PRIMER RESIDUE

13. Gunshot primer residue is composed of oxides, salts and/or free metals, of three different elements: lead, antimony, and barium.

14. When a gun is fired, gases from the gunshot primer escape through areas of the firearm that are not airtight. In most weapons, there are multiple such areas. However, each weapon has different numbers and configurations of non-airtight areas, so that the pattern and amount of gunshot primer residue that is ejected is different for different weapons. By test-firing a weapon with the relevant type of ammunition, it is possible to determine whether that particular weapon produces detectable quantities of gunshot primer residue, and if so what quantity that weapon produces.

15. Salts are combinations of metals and acids. Unburned gunshot primer consists of organic salts of the metals lead, barium, and antimony. When a gun is fired, the primer salts rapidly decompose and the organic acids are burned off producing large volumes of hot gasses, leaving the free vaporized metals and metallic compounds behind. Those metals—lead, barium, and antimony—are ejected from the firearm in the gaseous state. When they hit the air, they immediately cool and re-solidify.

16. When the primer metals solidify from the aerosol, they form minute solid, spherical particles. These spherical particles are composed of lead, antimony, and barium, though some particles may contain only some of these elements. Certain of the spherical particles will contain all three elements in combination. These are sometimes referred to as *unique particles.*

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VII. FOUR-HOUR WINDOW FOR DETECTING GUNSHOT PRIMER RESIDUE ON HUMAN BODIES

17. Gunshot primer residue can be detected on humans' bodies, and on clothing. Because hand-washing, or wiping one's hands, can remove gunshot primer residue, as can using the hands to grasp a door knob, steering wheel, etc., it is customary only to conduct gunshot primer residue testing on human bodies within as short a time interval since the weapon was fired as possible. Some agencies put an arbitrary time limit on this interval. It appears from the testimony in Mr. Young's case that a four-hour window, after the time the shot is believed to have been fired, was in use by the DPS in Texas when the crime occurred in 2001. Beyond that four-hour window, the chances of detecting gunshot primer residue on a human subject, and the reliability of any test result, diminishes significantly.

18. The four-hour window rule should not, however, apply to the testing of clothing or other inanimate objects. When a gun is fired, gunshot primer residue particles may become embedded in the fibers of cloth items located near the shot or transferred by contact with a hand that fired the weapon. Because these particles are embedded in the fabric, as opposed to residing on the surface of human skin, and such objects do not of their own accord move or rub against other objects, there is much less danger that the particles will be sloughed off by contact with other objects after a four-hour window or during any predictable time frame. Assuming a cloth item is not washed, it is possible to test for and detect gunshot primer residue particles months or years after they are deposited on such objects.

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VIII. METHODS OF TESTING FOR GUNSHOT PRIMER RESIDUE

19. There are two commonly-used methods for testing for the presence of gunshot primer residue. The first is called an "atomic absorption spectroscopy" test ("AAS" test). This method involves the detection of the lead, antimony and barium by means of an atomic absorption spectrometer, which can detect minute (parts per million) quantities of these elements. This technique is rarely used today because the instrument cannot determine if the elements are all associated with each other, as they are in a single sphere of GPR, or instead come from other sources. This is because the particles are all dissolved in acids and the resulting homogeneous solution is analyzed and not the individual particles.

20. The other, and most commonly-used method for the detection of GPR today, is scanning electron microscopy/energy dispersive x-ray spectroscopy (SEM/EDS). This method involves the use of an electron beam to image particles and analyze their individual elemental compositions. Thus a single spherical particle can be located in the instrument and the electron beam focused onto it and its elemental composition obtained in a matter of seconds. This permits the automated scanning of large numbers of particles on a stub in a matter of hours. Any spherical particles that contain any or all of the required elements can be detected and their numbers tallied.

21. The SEM/EDS is more probative in detecting the presence of gunshot primer residue than the AAS test, because SEM/EDS testing is able to determine both the shape of the particles being analyzed *and* their elemental compositions. The AAS test is only able to detect the presence of the chemical elements themselves, and not the shapes of the particles or even if the elements originate from single particle types.

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IX. POST-2003 CHANGES IN METHODS OF EXTRACTING AND TESTING FOR GUNSHOT PRIMER RESIDUE IN CLOTH FIBERS

A. Ultrasonic Method of Extracting Gunshot Primer Residue Particles

22. Both SEM/EDS and AAS testing methods were known and widely used at the time of Mr. Young's trial in 2003. However, at the time of Mr. Young's 2003 trial there was no generally-accepted reliable way for extracting particles of gunshot primer residue from cloth fibers or clothing. Thus, it was not common at the time of Mr. Young's 2003 trial for law enforcement to conduct either SEM/EDS or AAS testing on cloth items such as the gloves in this case.

23. Law enforcement did not generally try to test cloth items for GPR between 2001 and 2003, because there was no reliable and generally-accepted way to extract the GPR particles from the cloth fibers. When a firearm is discharged near a cloth item, some of the spherical particles of gunshot primer residue that are ejected from the firearm will land on it. The spherical particles of gunshot primer residue are extremely small compared to the fibers that make up the threads or yarns of the cloth, such that one yarn fiber could (theoretically) contain dozens of such particles just across its width. Without any means of removing the gunshot primer residue particles from the fibers, it is virtually impossible to test for the presence of such particles. Even if a fiber from the cloth is examined under an SEM, the particles may be hidden on the backsides of fibers such that they could not be seen.

24. In 2003, as today, law enforcement generally attempts to extract gunshot primer residue particles from cloth, as from hands, by using sticky tabs. This method involves placing electrically conductive adhesive tabs onto the cloth to attempt to extract gunshot primer residue particles. However, because such

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particles are extremely small compared to cloth fibers on which they are resting, and because numerous such fibers can be entwined in even a single cloth thread, it is common for the fibers themselves to come off on the tape along with the particles, which may hide on the undersides of the fibers or in other locations not visible under the microscope. The presence of the fibers also interferes with the operation of the microscope itself by electrically charging. Consequently, in 2003 there was no reliable and commonly accepted way to examine clothing for the presence of gunshot primer residue using the SEM/EDS.

25. Although methods for removing GPR from difficult substrates such as cloth have been studied and subjected to research since the problem became evident in the 1990s, this was largely a research interest and not used in actual casework until later in the early 2000s when scientists began developing more reliable methods for extracting gunshot primer residue particles from cloth that could be used in casework. One of the earliest methods used collection onto a small vacuum cleaner. Recent developments, which are discussed at scientific meetings but not generally known by those who do not attend them, are coming to light and some of these have potential for use in casework. This includes the use of ultrasonics. In this method, a piece of the cloth is cut out and placed into a centrifuge tube with a pure inert liquid such as ethanol. Ultrasonic waves are then passed through the cloth, which cause the gunshot primer residue particles to dislodge and fall to the bottom of the centrifuge tube where they are concentrated. The particles can then be extracted and examined by SEM/EDS to determine whether they have the spherical shape and elemental composition characteristic of gunshot primer residue.

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B. New Techniques for the Detection of GPR

26. In the last 10 to 15 years, several new methods have also been proposed for the identification of GPR particles. In the early years of development these were reported only as research results and presented in obscure scientific journals. They had not been tested or validated in forensic laboratories and, therefore, could not be used in casework. Thus, although a technique may have been tried in a research situation it would not be used in a forensic laboratory for casework until much later and then only after it had been validated and the necessary instruments purchased.

27. The first of these developments was the detection of the decomposition residues from the organic acids fraction of the primers. These have been studied particularly by Dutch and German forensic scientists and although they have presented results at scientific conferences these techniques are little used in the U.S. today, because U.S. forensic laboratories are slow to take up these methods, which often require more sophisticated scientific procedures than those used in many smaller U.S. laboratories and due to the fact that there is little call for this type of analysis.

28. Another method, Raman Microspectroscopy, has also been used to unambiguously identify the lead, antimony and barium compounds that form after gunshot primer discharge. The first paper on this topic, of which I am aware, appeared in an obscure (to forensic scientists) journal (Journal of Raman Spectroscopy) in 1998. Although it is in the literature, it not used in any U.S. laboratories today because most such laboratories lack the instrumentation and have not validated it for use.

29. Yet another new method for detecting GPR is the use of a Transmission Electron Microscope ("TEM"). This method enables detection of

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smaller particles of GPR than can be detected under an SEM/EDS. The results of proficiency testing for laboratories that perform GPR analysis show that many GPR particles in the low micron and submicron size ranges are not detected in forensic laboratories performing these tests. This has to do with a variety of factors, not all of which are fully understood. The transmission electron microscope (TEM) can perform elemental analyses and image much smaller GPR particles than is possible with the standard SEM/EDS used in most forensic laboratories. A recent paper (2012) has shown that the TEM can be used to observe and identify particles of GPR that are essentially "invisible" to the SEM. The paper is Whitney B. Hill, *Transmission Electron Microscopy Study of Gunshot Residue Nanoparticles Collected in Air Samples*, THE MICROSCOPE Vol. 60:3, at 133-137 (2012). The technique of using TEM/EDS to look at GPR is a recent development as noted in this recent paper. Because larger particles of GPR are typically the first to fall off of an item, leaving the smaller particles behind, it is likely that a TEM would enable detection of particles of GPR on the gloves in this case, if such particles are present, that could not have been detected using the SEM/EDS available in 2003.

30. A true and correct copy of the 2012 article referred to in the above paragraph, Whitney B. Hill, *Transmission Electron Microscopy Study of Gunshot Residue Nanoparticles Collected in Air Samples*, THE MICROSCOPE Vol. 60:3, at 133-137 (2012), is attached to this declaration as Exhibit B.

31. It is extremely difficult, if not impossible, to put exact dates on new methods of sample collection and analysis for GPR. This is due to the fact that just because a technique is described at a scientific meeting or published in a scientific journal, that the method has been accepted, validated or has been employed in casework by any given laboratory. Accreditated laboratories also face the hurdle

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of a lengthy process of incorporating these procedures in their scope of work. For a test that is rarely requested, acceptance and use of a particular test may never be worth the trouble to the laboratory called upon to perform it.

X. VIABILITY OF TESTING FOR GUNSHOT PRIMER RESIDUE ON THE GLOVES IN THIS CASE

32. I understand, from the materials provided to me by Mr. Young's counsel, that the gloves Mr. Young seeks to access for testing were found in November 2001 at the site of a homicide.

33. I further understand that, according to the trial testimony, Mr. Young and another person named David Page were the only two people present with the victim during the 2001 homicide at the scene of which the gloves were found. I understand that Mr. Young wishes to test the gloves for the presence of gunshot primer residue to determine whether they might have been worn by Mr. Page while Mr. Page fired a gun.

34. I further understand from the materials provided by counsel that the gloves were subjected before Mr. Young's trial to some form of testing by an examiner named Tim Counce. Mr. Counce testified at trial that he conducted a sodium rhodizonate test on the gloves, and that in the course of conducting that test he sprayed the gloves to test them for the presence of lead. Mr. Counce does not state the composition of the actual reagent composition he sprayed the gloves with, or the details of that test. No protocol outlining the procedure and reagent composition was provided.

35. Sodium rhodizonate testing only detects the presence of lead, not gunshot primer residue as such. Lead can be deposited on material by a lead bullet or the interior of a jacketed bullet, or by gunshot primer residue, but it can also come from other sources. Thus, while a positive result of a sodium rhodizonate

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test may be consistent with the presence of gunshot primer residue (if properly conducted), it does not necessarily indicate that such residue is present.

36. Depending on how Mr. Counce conducted his sodium rhodizonate testing—a matter that is not clear from the materials I reviewed—he may or may not have destroyed any particles of gunshot primer residue that might once have been present on the gloves. Assuming Mr. Counce sprayed the gloves with acetic acid, which is the substance commonly used in sodium rhodizonate testing, then depending on the concentration of the acid, it is possible that some of the gunshot primer residue particles may have dissolved as a result of those tests. However, it is also possible that they did not dissolve, and are still present on the gloves.

37. Because it is not possible to determine whether Mr. Counce's testing methods were such as to cause gunshot primer residue particles to dissolve, the absence of any such particles on the gloves today would not necessarily indicate that the gloves were not worn in 2001 by the shooter of a firearm. Nor would it indicate that the gloves did not have gunshot primer residue deposited on them at some point before Mr. Counce conducted his testing.

38. However, if the gloves are tested today and are found to contain substantial amounts of gunshot primer residue, that finding would strongly indicate that the gloves were, in fact, worn by the shooter of a gun, or located very close to a firearm at the time it was discharged, at some time before the gloves were recovered at the homicide site in 2001.

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39. If the gloves are released to Mr. Young's counsel and sent to my laboratory (Microtrace LLC, in Elgin, Illinois), I intend to utilize the sonication method described above in paragraphs 22-25 to extract any particles of possible gunshot primer residue from the gloves. My laboratory will then subject those particles to SEM/EDS and TEM/EDS analysis to determine whether there is, in fact, any gunshot primer residue on the gloves.

I, Samuel Palenik, declare under penalty of perjury under the laws of Texas and the laws of the United States of America that the foregoing is true and correct. Executed this 2nd day of April, 2015, in Elgin, Illinois.

Samuel Palenik

OFFICIAL SEAL
ADAM VIETMEIER
Notary Public - State of Illinois
My Commission Expires Apr 20, 2018

Initials

EXHIBIT A

Curriculum Vitae

of

Skip Palenik

(spalenik@microtracellc.com)

Current as of 5/16/2014

Microtrace
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Elgin, IL 60123-4755

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www.microtracescientific.com

Table of Contents

Educational History

- University of Illinois at Chicago, Bachelor of Science – Chemistry (ACS) with emphasis on analytical methods.
- McCrone Research Institute, Chicago. Courses in photomicrography, applied polarized light microscopy, identification of small particles, advanced crystallography and scanning electron microscopy.
- Courses in hair microscopy, species identification of paper fibers, paper fiber analysis, pollen identification, microscopy of soil minerals, cement microscopy, pharmacognosy, micro-techniques, wood identification, thin layer chromatography and vegetable fiber identification.

Employment

- Founder, President and Senior Research Microscopist, Microtrace (1992 – present)
- Senior Research Associate, McCrone Associates (1987 – 1992)
- Senior Research Microscopist, McCrone Associates (1979 – 1992)
  - Supervise light microscopy section. Application of polarized light microscopy and microchemical methods to the identification of single particles. Research in new methods to aid in the identification of microscopic particles of minerals, industrial dusts, combustion products, botanical fragments, hairs, fibers and crystals; application of these methods to forensic science, contamination control and airborne particulate studies. Court qualified expert (State, Federal and Foreign courts) in forensic microscopy and chemistry.
- Research Microscopist, McCrone Associates (1974 – 1979)
- Research Assistant, Department of Criminal Justice, University of Illinois at Chicago (1972 – 1974)
  - Analytical chemistry and microscopy applied to criminalistics.
- Research Assistant, Department of Chemistry, University of Illinois at Chicago (1970 – 1972)
  - Coordination compound chemistry and crystallography.
- Intelligence Analyst, United States Army Intelligence, Stuttgart, Federal Republic of Germany (1966 – 1969)

Professional Affiliations

- McCrone Research Institute, Chicago, Board of Directors
- American Chemical Society, Member
- American Academy of Forensic Sciences, Fellow
- Scientific Working Group for the analysis of Geological Materials (SWGGEO), founding member
- American Society of Trace Evidence Examiners (ASTEE), Charter Member

- American Association of Feed Microscopists, Member
- American Association of Textile Chemists and Colorists, Member
- American Association of Stratigraphic Palynologists, Member
- American Association of Feed Microscopists, sub-division of American Oil Chemists Society, Member.
- California Association of Criminalistics, Member
- Canadian Society of Forensic Science, Member
- Chicago Society for Coatings Technology, Member
- International Association of Wood Anatomists, Member
- Midwestern Association of Forensic Scientists, Member
- State Microscopical Society of Illinois, Member, past President, past Curator
- Queckett Microscopical Club, United Kingdom, Member
- Royal Microscopical Society, United Kingdom, Fellow

Honors

- 2013 Recipient of the "Edmond Locard Award for Excellence in Trace Evidence" presented by the American Society of Trace Evidence Examiners
- 2012 Recipient of the "Ernst Abbe Memorial Award" presented by the New York Microscopical Society
- 2010 Recipient of the "Chamot" Award presented by the State Microscopical Society of Illinois
- 2009 Recipient of the "Paul L. Kirk" Award the highest honor bestowed by the Criminalistics Section of the American Academy of Forensic Sciences
- 2004 Distinguished Scientist Award, Midwestern Academy of Forensic Sciences
- Listed in American Men and Women in Science

Expert Testimony and Deposition

- List can be provided upon request.

Teaching Experience

- Instructor, McCrone Research Institute, Chicago (1975 – present). One to three week short courses in chemical microscopy, applied polarized light microscopy, microchemical analysis, crystallography, hairs, fibers, polymers, food contaminants, botanical fragments and pollens.

- Adjunct Lecturer, University of Illinois at Chicago, School of Pharmacy, Department of Pharmacokinetics (1989 – 1992)
- Adjunct Lecturer, University of Illinois at Chicago, Department of Criminal Justice (1986 – 1989). Quarter courses in Chemical Microscopy and Applied Analytical Chemistry.
- Instructor, Illinois Institute of Technology, Chicago (1975 – 1979). Semester courses in Chemical Microscopy.

Research Grants

Advanced research in Microspectrophotometry of Fibers: Analysis and Interpretation (National Institute of Justice, 2012-DN-BX-K040) – Role: Principal Investigator

Development of a Turnkey Analytical System for the Forensic Comparison and Identification of Fiber Dyes on Casework-sized Fibers (National Institute of Justice, 2012-DN-BX-K42) – Role: Co-Principal Investigator

Raman spectroscopy of automotive and architectural pigments: in situ identification and evidentiary Significance (National Institute of Justice, 2011-DN-BX-K557) – Role: Co-Principal Investigator

Fundamentals of Forensic Pigment Identification by Raman microspectroscopy: A practical identification guide and spectral library (National Institute of Justice, 2010-DN-BX-K236) – Role: Co-Principal Investigator

Publications and Teaching

<u>Courses and Workshops Taught</u>

- US Army Criminal Investigation Laboratory
    - Forensic Soil Examination
- Washington State Police
    - Advanced Topics in Trace Evidence Analysis (2 weeks)
- Royal Canadian Mounted Police (Canada)
    - Forensic Microscopy
- Pitcon Conference
    - Microscopy & Microanalysis
- Texas Department of Public Safety
    - Forensic Microscopy
    - Forensic Examination of Fibers
- State of North Carolina Crime Laboratory
    - Forensic Microscopy
- New York City Crime Laboratory
    - Special Techniques of Forensic Microscopy
- State of Louisiana Crime Laboratory

    - Forensic Fiber Microscopy

- State of Illinois Crime Laboratory
    - Vegetable Fibers

- California Criminalistics Institute
    - Identification of Animal Hair
    - Forensic Soil Microscopy

- Forensic Science Service (United Kingdom)
    - Human Hair Comparison

- Linear Health Care
    - Introduction to Pharmacognosy

- State Microscopical Society of Illinois
    - General Microscopy, Forensic Paper Identification

- Forensic Science Foundation
    - Basic Forensic Microscopy
    - Forensic Microscopy of Soils
    - Forensic Microscopy of Botanical Materials
    - Forensic Analysis of Fibers

- United States Customs
    - Analytical Microscopy
    - Identification of Dog and Cat Hairs to Enforce New U.S. Regulations

- Royal Canadian Mounted Police
    - Forensic Fiber Microscopy

- Louisiana State Crime Laboratories
    - Forensic Hair Microscopy

- 3M Research Laboratories
    - Microchemical Analysis

- Campbell Center for Historic Conservation (Museum Conservators)
    - Identification of Plant Fibers of Ethno-botanical Interest
    - Microchemistry for Objects Conservators

Publications (Select)

Ballou, S., Houck, M., Siegel, J.A., Crouse, C.A., Lentini, J.J., and Palenik, S. (2013) "Criminalistics: the bedrock of forensic science" in Forensic Science: Current Issues, Future Directions, Ubelaker, D.H. (ed.) Wiley-Blackwell.

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Palenik, SJ, Microscopic Trace Evidence – The Overlooked Clue, Part I, Albert Schneider Looks at Some String. *The Microscope*, Vol. 30, 93-100 1982.

Palenik, SJ, Microscopic Trace Evidence – The Overlooked Clue, Part II, Max Frei – Sherlock Holmes with a Microscope. *The Microscope*, Vol. 30, 163-170, 1982.

Palenik, SJ, Microscopic Trace Evidence – The Overlooked Clue, Part III, E.O. Heinrich – "The Wizard of Berkeley". Traps a Left-Handed Lumberjack. *The Microscope*, Vol. 30, 281-290, 1982.

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EXHIBIT B

THE MICROSCOPE • Vol. 60:3, pp 133–137 (2012)

Transmission Electron Microscopy Study of Gunshot-Residue Nanoparticles Collected in Air Samples

Whitney B. Hill
MVA Scientific Consultants[1]

KEYWORDS

Air sampling, energy dispersive X-ray spectroscopy (EDS), nanoparticles, gunshot residue (GSR), transmission electron microscopy (TEM)

ABSTRACT

Traditional gunshot residue (GSR) is usually defined as opaque, individual particles having a characteristic spheroidal shape and composed of the elements lead (Pb), barium (Ba) and antimony (Sb). Routine GSR analysis is performed by scanning electron microscopy (SEM) coupled with energy dispersive X-ray spectroscopy (EDS) and concentrates on particles that are 0.5 μm or larger with diameters less than 5 μm. The purpose of this study was to determine if GSR particles with diameters in the nanometer-size range (10 nm–100 nm) are released into the atmosphere during the discharge of a firearm, and whether transmission electron microscopy (TEM) coupled with EDS is suitable for the detection and analysis of GSR nanoparticles in air samples.

INTRODUCTION

Experiments were performed using TEM-EDS to collect and characterize the GSR particles released in the air during the discharge of a firearm. A total of nine samples of GSR were generated by firing five rounds of Browning High Powered, full metal jacket (FMJ) and Sellier and Bellot (S&B) ammunition from a 9 mm handgun and three rounds of Winchester WinClean ammunition, also from a 9 mm handgun, in an enclosed facility. Air samples were collected simultaneously with the firing of each round of ammunition. The air pumps and filters were strategically set up at varying distances from the muzzle and ejection port of the handgun for each sample that was collected. An ambient air sample was collected 12 hours after firing the initial five rounds of ammunition.

METHODS

Sample Collection

The GSR samples were collected on 0.45 μm pore size, 25 mm diameter, mixed cellulose ester (MCE) filters and prepared according to procedures described in the NIOSH 7402 method for TEM. Each GSR sample was collected by pulling 10 liters (L) of air through each MCE filter with a high volume pump. The samples were collected with a 25 mm cassette in the open face position. The ambient air sample was collected by pulling 150 L of air through each MCE filter with a high volume pump. The description and location for each air filter in relation to the firearm is listed in Table 1.

Sample Preparation

Each sample was prepared according to NIOSH Method 7402, where a portion of the filter is cut, placed on a glass slide and collapsed using acetone in a Jaffe washer (1). The collapsed air filters were then coated with carbon using a Denton vacuum evaporator, and portions of the carbon-coated filter were cut and

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Table 1. GSR Sample Descriptions and Locations

Sample No.	Ammunition	Sample Description	Air Volume (Liters)
1	S&B	Level with muzzle, 4" to right and 20" from muzzle	10
2	S&B	6" right of ejection port, 4" lower than ejection port	10
3	S&B	36" from muzzle, 5" to the right	10
4	S&B	2" from muzzle, 1" down and 1" to the right	10
5	S&B	By ejection port but closed after firing, to the right of port	10
6	Not available	Ambient sample taken 12 hours after shots 1–5.	150
7	WinClean	6" to the right, open ejection port, 1" down (open breeze)	10
8	WinClean	36" in front of the muzzle	10
9	WinClean	24" to the front of the ejection port, 32" to the right	10

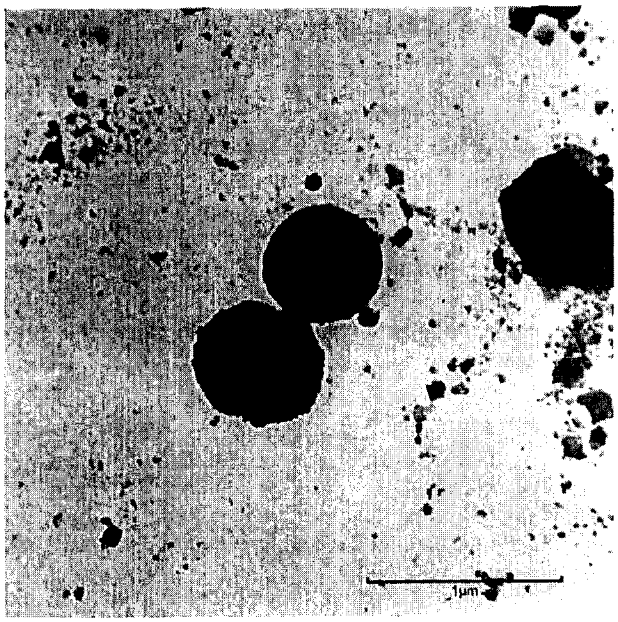

Figure 1. TEM image of particles collected on the filter during the discharge of one round of S&B ammunition. Scale bar = 1 μm.

placed on TEM grids. The filters were dissolved using dimethyl formamide and acetone, leaving only the particles that were left on the grid encased in the carbon thin film. TEM grids come in several different materials such as nickel, aluminum, gold, titanium and stainless steel; however, for this experiment each sample was prepared on copper-mesh TEM grids.

Sample Analysis

For each GSR sample, 10 fields of view were imaged at an instrument magnification of 25,000x. The electron micrographs were generated using a Philips CM 120 TEM operated at 100 kV with a bottom mount 4-megapixel digital camera. The microscope was calibrated using the MAG*I*CAL® calibration reference standard for TEM (2). The images were annotated with a scale bar with the pixel length determined by the MAG*I*CAL®. Each annotated image was opened in ImageJ software, and the magnification scale was set using the scale bar in the image (3). The particles in each image were sized using the "threshold" feature in ImageJ. The "watershed" feature in ImageJ was also used for some images to separate the particles that appeared to be touching each other. The elemental composition of select particles was determined using an Oxford Inca EDS.

RESULTS

Samples 1–5: S&B Ammunition

Samples 1–5 consisted of particles that were both spheroidal and non-spheroidal in morphology, as shown in Figure 1.

For Sample 1, a total of 4,177 particles were counted and sized using ImageJ. Of the 4,177 particles sized, 95.7% are in the range of 5 nm to 100 nm, 4.29% are between 100 nm and 1 μm, and 0.01% are greater than 1 μm in diameter. For Sample 2, a total of 1,082 particles were counted and sized using ImageJ. Of the 1,082 particles sized, 95.1% of the particles sized are between 5 nm and 100 nm, 4.9% are between 100 nm and 1 μm, and 0% are greater than 1 μm in diameter. Sample 3 resulted in a total of 2,326 particles that were counted and sized. Of the 2,326 particles sized, 90.9% range between 5 nm and 100 nm in diameter, 9% range between 100 nm and 1 μm, and 0.1% are greater than

Table 2. Particle Size Distribution of S&B Samples

Particle Diameter Size Fractions	No. of Particles
5 nm–50 nm	6,875
50 nm–100 nm	1,520
100 nm–500 nm	476
500 nm–1 μm	15
>1 μm	4

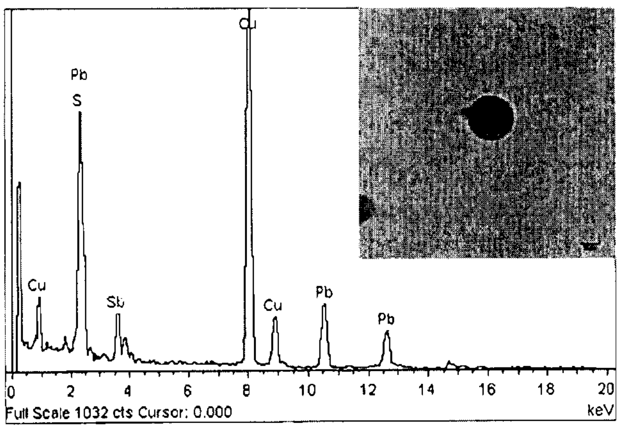

Figure 2. TEM image and EDS spectrum of a nanoparticle composed of Pb and Sb from the S&B samples. Scale bar = 30 nm.

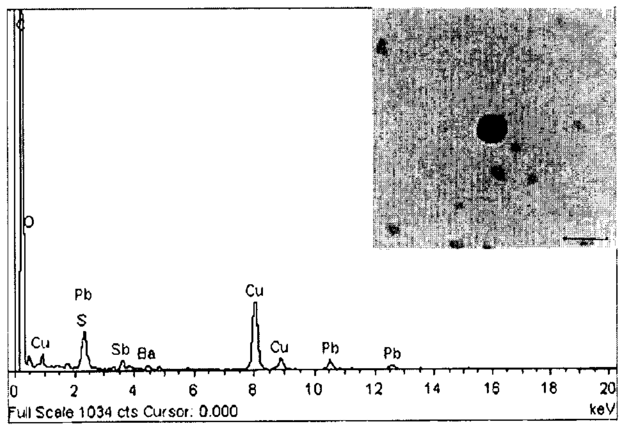

Figure 3. TEM image and EDS spectrum of a GSR nanoparticle found in the S&B samples. Scale bar = 100 nm.

1 μm in diameter. For Sample 4, the filter was damaged during the blast and no data was generated. For Sample 5, a total of 1,305 particles were sized. Of the 1,305 particles sized, 95% range between 5 nm and 100 nm, 4% range from 100 nm to 1 μm, and 1% are greater than 1 μm in diameter. The particle size distribution data for all particles sized in Samples 1–5 is listed in Table 2.

EDS was performed on randomly selected nanoparticles that were detected on the filter media to determine the elemental composition. EDS showed that some particles are composed of lead only. EDS also revealed that other particles contained varying amounts and combinations of Pb, Sb, Ba, sulfur (S), calcium (Ca), iron (Fe), zinc (Zn), chlorine (Cl) and possible copper (Cu), as shown in Figures 2–4. The source of the Cu in these samples could be a combination of the particles and also the copper-mesh TEM grids on which the sample was prepared.

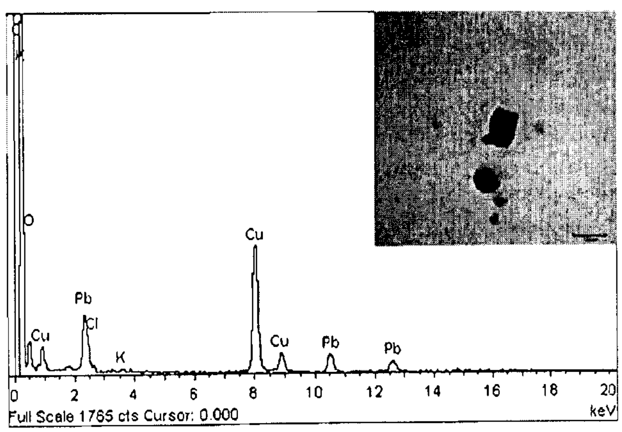

Figure 4. TEM image and EDS of a non-spheroidal lead nanoparticle found in the S&B samples. Scale bar = 100 nm.

Samples 6: Ambient Air Sample Collected 12 Hours After S&B Sample Collection

For Sample 6, a total of 10 grid openings were analyzed. GSR nanoparticles containing Pb, Ba and Sb were

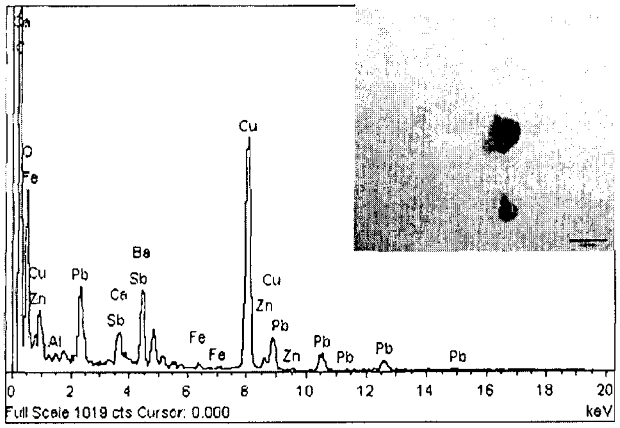

Figure 5. TEM image and EDS spectrum GSR nanoparticles found in the ambient air sample. Scale bar = 100 nm.

detected within the sample, as shown in Figure 5.

EDS also revealed that other nanoparticles within Sample 6 consist of varying amounts of Pb, Ba, S, Fe, Sb, Ca and possible Cu.

Samples 7–9: Winchester WinClean Ammunition

Samples 7–9 consisted of mostly spheroidal particles that varied in size, as shown in Figure 6. There were significantly less particles collected on each filter during the WinClean sampling.

For Sample 7, a total of 71 particles were counted and sized using ImageJ. Of the 71 particles sized, 74% range from 5 nm to 100 nm, 26% are within 100 nm and 1 μm, and 0% are greater than 1 μm in diameter. For Sample 8, a total of 203 particles were counted and sized using ImageJ. Of the 203 particles sized, 83% are within 5 nm and 100 nm, 17% are within 100 nm and 1 μm, and 0% are greater than 1 μm in diameter. For Sample 9, a total of 42 particles were counted and sized using ImageJ. Of the 42 particles analyzed, 71.4% are within 5 nm and 100 nm, 28.6% are within 100 nm and 1 μm, and 0% is greater than 1 μm in diameter. The particle size distribution data for Samples 7–9 can be found in Table 3. EDS was performed on randomly selected nanoparticles that were detected on the filter media to determine the elemental composition. EDS results illustrated that some particles consisted of a single element such as Pb and Cu, as shown in Figure 7. The Cu peak in Figure 7 could possibly be a result of both the particle and also the Cu-mesh TEM grid on which the sample was prepared. EDS also revealed that other particles contained varying amounts and combinations of Pb, Sb, Ba, S, Ca, Fe, Zn, Cl and possible Cu, as shown in Figures 8 and 9.

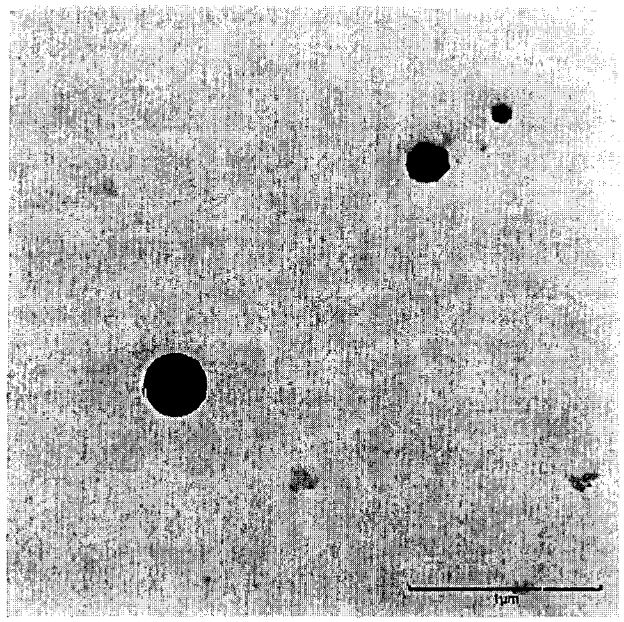

Figure 6. TEM image of particles collected on the filter during the discharge of one round of WinClean ammunition. Scale bar = 1 μm.

CONCLUSIONS

This study confirms that, depending on the ammunition, thousands of sub-micrometer nanoparticles are ejected into the atmosphere during the discharge of a firearm. In this study, 80%–94.4% of the particles are within the nanometer-size range. This study also shows that the nanometer-size particles can remain suspended in the air for up to 12 hours after they have been released. The presence of GSR nanoparticles can be very valuable because they are much more abundant than particles greater than 1 μm in diameter and are likely to remain in the air for longer periods of time. Therefore, the detection of GSR nanoparticles may be significant to future forensic investigations. TEM-EDS is instrumental in the analysis of GSR nanoparticles because of its high magnification capability and the ability to gather elemental data from nanometer-size particles.

ACKNOWLEDGMENTS

The author would like to thank Peter Diaczuk, Richard Brown, Jim Millette and Randy Boltin for their assistance, mentorship and insightful comments and suggestions during the experiment process and the review of this article.

Table 3. Particle Size Distribution of WinClean Samples

Particle Diameter Size Fractions	No. of Particles
5 nm–100 nm	252
100 nm–500 nm	56
500 nm–1 µm	8
>1 µm	0

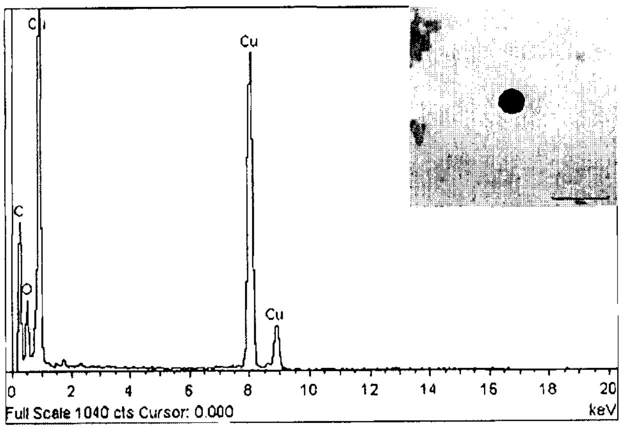

Figure 7. TEM image and EDS of a copper nanoparticle detected in the WinClean samples. Scale bar = 250 nm.

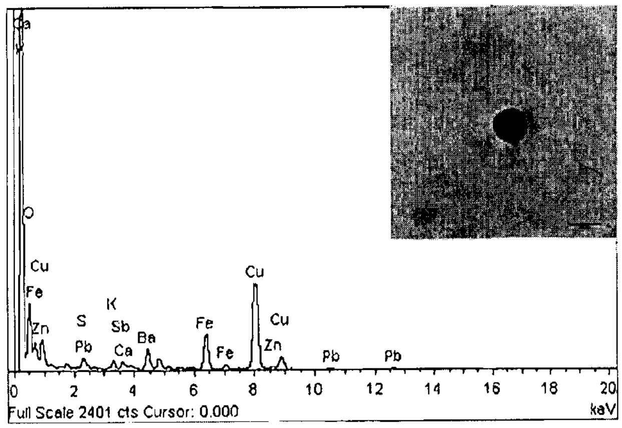

Figure 8. TEM image and EDS of a GSR nanoparticle from WinClean samples. Scale bar = 100 nm.

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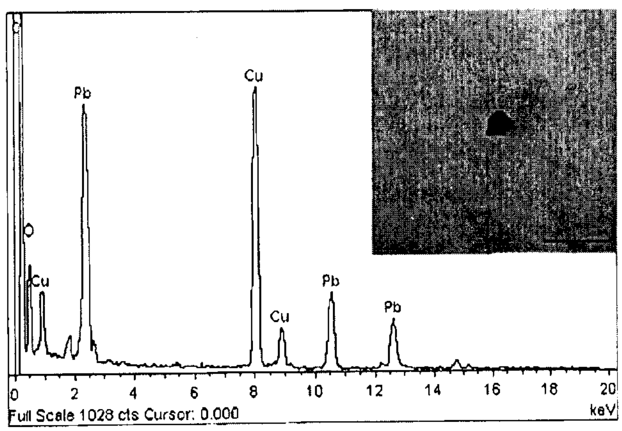


Figure 9. TEM image and EDS of a Pb nanoparticle found in the WinClean samples. Scale bar = 250 nm.

EXHIBIT

2

FILED

RE-INDICTMENT

2002 FEB -7 AM 9: 12

VIVIAN WOOD, DISTRICT CLERK
MIDLAND COUNTY, TEXAS

Assigned Judge: HYDE

NO. CR27181 BY [signature] DEPUTY

THE STATE OF TEXAS	*	IN THE DISTRICT COURT
	*	
V.	*	385TH JUDICIAL DISTRICT
	*	
CLINTON LEE YOUNG	*	MIDLAND COUNTY, TEXAS

Bond: $500,000.00

Offense: **CAPITAL MURDER**

INDICTMENT

IN THE NAME AND BY AUTHORITY OF THE STATE OF TEXAS:

THE GRAND JURY, for the County of Midland, State of Texas, duly selected, impaneled, sworn, charged, and organized as such by the 385th Judicial District Court for said County at the January Term of 2002 of the said Court, upon their oaths present in and to said Court that CLINTON LEE YOUNG, hereinafter styled Defendant, on or about the 26th day of November A. D., 2001, and before the presentment of this indictment, in the County and State aforesaid, did then and there intentionally and knowingly cause the death of an individual, Samuel Petrey, by shooting him with a firearm, and on or about the 25th day of November A. D., 2001 in a different criminal transaction, the said CLINTON LEE YOUNG did then and there intentionally and knowingly cause the death of an individual, Doyle Douglas, by shooting him with a firearm, and the said CLINTON LEE YOUNG murdered the said Samuel Petrey and the said Doyle Douglas pursuant to the same scheme and course of conduct;

COUNT II

AND THE GRAND JURORS AFORESAID upon their oaths aforesaid, do further present in and to said court that CLINTON LEE YOUNG, hereinafter styled Defendant, on or about the 26th day of November A. D., 2001, and before the presentment of this indictment, in the County and State aforesaid, did then and there intentionally cause the death of an individual, Samuel Petrey, by shooting him with a firearm, and the said CLINTON LEE YOUNG did then and there intentionally cause the death of the said individual in the course of committing and attempting to commit the offense of kidnapping and robbery directed against Samuel Petrey;

against the peace and dignity of the State.

Diane Cuevas
FOREMAN OF THE GRAND JURY

DIANE CUEVAS

EXHIBIT
3

FINAL

NO. CR 27,181

THE STATE OF TEXAS	*	IN THE DISTRICT COURT
	*	
V.	*	385TH JUDICIAL DISTRICT
	*	
CLINTON LEE YOUNG	*	MIDLAND COUNTY, TEXAS

VERDICT OF THE JURY

PARAGRAPH I

GUILTY OF CAPITAL MURDER OF SAMUEL PETREY AND DOYLE DOUGLAS IN PARAGRAPH I

We, the jury, find beyond a reasonable doubt that the defendant, CLINTON LEE YOUNG, is guilty of the offense of CAPITAL MURDER of Samuel Petrey and Doyle Douglas as charged in paragraph I of the indictment.

3/27/03

[redacted] March 27, 2003

DATE

PRESIDING JUROR

000835

FINAL

NO. CR 27,181

THE STATE OF TEXAS	*	IN THE DISTRICT COURT
	*	
V.	*	385TH JUDICIAL DISTRICT
	*	
CLINTON LEE YOUNG	*	MIDLAND COUNTY, TEXAS

VERDICT OF THE JURY

PARAGRAPH II

GUILTY OF CAPITAL MURDER OF SAMUEL PETREY IN PARAGRAPH II

We, the jury, find beyond a reasonable doubt that the defendant, CLINTON LEE YOUNG, is guilty of the offense of CAPITAL MURDER of Samuel Petrey as charged in paragraph II of the indictment.

March 27, 2003
DATE

James E. [illegible]
PRESIDING JUROR

000836

EXHIBIT
4

acts knowingly, or with knowledge, with respect to a result of his conduct when he is aware that his conduct is reasonably certain to cause the result. The foregoing definition of intentionally, or with intent, and knowingly, or with knowledge, are the only definitions of intent and knowledge that apply to the element "cause the death" in the definition of the offense of CAPITAL MURDER and MURDER.

A person acts intentionally with respect to the nature of his conduct when it is his conscious objective or desire to engage in the conduct. A person acts knowingly, or with knowledge, with respect to the nature of his conduct or to circumstances surrounding his conduct when he is aware of the nature of his conduct or that the circumstances exist.

6.

A person is criminally responsible as a "party" to an offense if the offense is committed by his own conduct, or by the conduct of another for which he is criminally responsible or by both.

A person is criminally responsible for an offense committed by the conduct of another if acting with the intent to promote or assist the commission of the offense, he solicits, encourages, directs, aids, or attempts to aid the other person to commit the offense.

Mere presence alone will not constitute one a party to an offense. To be a party to an offense on the basis of criminal responsibility for the conduct of another, the evidence must show that at the time of the offense the parties were acting together, each contributing some part towards the execution of their common purpose.

7.

Now with respect to the offense of CAPITAL MURDER in paragraph I of the indictment and bearing in mind the foregoing instructions, if you believe from the evidence beyond a reasonable doubt that the defendant, CLINTON LEE YOUNG, on or about the 26th day of November, 2001, in the County of Midland and State of Texas, as alleged in paragraph I of the indictment, did then and there intentionally or knowingly cause the death of an individual, Samuel Petrey, by shooting him with a firearm, **OR** if you believe from the evidence beyond a reasonable doubt that DAVID PAGE, on or about the 26th day of November 2001, in the County of Midland and State of Texas, did then and there intentionally or knowingly cause the death of an individual, Samuel Petrey, by shooting him with a firearm, AND you further believe beyond a reasonable doubt that the defendant, CLINTON LEE YOUNG, acting with the intent to promote or assist the commission of the said offense of MURDER of Samuel Petrey, did then and there solicit, encourage, direct, aid, or attempt to aid DAVID PAGE to

EXHIBIT

5

SAN ANGELO POLICE DEPARTMENT
C.I.D./POLYGRAPH SECTION
POLYGRAPH REPORT

R02-022

OFFENSE: HOMICIDE

VICTIM: Doyle Douglas, White, Male
Samuel Petry, DOB: 09/09/47, White, Male

EXAMINATION REQUESTED BY: J.D. Luckie, Chief Criminal Investigator

POLYGRAPH SUBJECT: David Lee Page (Jr.), DOB: 10/22/81, White, Male,
DL: 18873721 TEXAS, SSN: 567-71-7239

CASE BRIEF: On this date, David Lee PAGE (in the presence of his attorney-H.W. Leverett (Jr.), Investigator Luckie and Deputy Kent Spencer) gave this investigator a synopsis of what took place in the murders of Doyle Douglas and Samuel Petry.

On Sunday morning at about 2:00 a.m., (PAGE said that) he, Clinton YOUNG, Mark RAY and Darnell MCCOY were in Longview, Texas with Doyle Douglas. PAGE said that YOUNG shot DOUGLAS on the right side of the head with a .22 caliber automatic. YOUNG said the bullets bounced off DOUGLAS'S head. DOUGLAS was placed in the trunk of his car and driven to an area just inside Harrison County. PAGE said he could hear a gurgling sound come from the trunk as they drove to a location to dump the body. PAGE said he knew that DOUGLAS was still alive.

In Harrison County, all present helped remove DOUGLAS from the trunk of the car. PAGE said that YOUNG threatened to shoot them if they did not participate. PAGE said that RAY shot DOUGLAS on the back of the head with a .22 caliber revolver. DOUGLAS'S body was left in Harrison County. PAGE said the revolver belonged to "Hippie" HALLMARK and once returning to Longview, the revolver was returned to HALLMARK. (A .380 caliber weapon was also in the car at the time of DOUGLAS'S murder, but was not used to kill DOUGLAS.)

PAGE said all four returned to Longview in DOUGLAS'S car. RAY and MCCOY were dropped off in Longview and YOUNG drove PAGE to Ore City, Texas.

Investigation: HOMICIDE
Examinee: PAGE David Lee (Jr.)
Polygraph #R02-022

At the Brookshires Grocery Store parking lot, YOUNG and PAGE drove up to Samuel PETRY. PAGE said that they spoke to PETRY and then YOUNG "put the gun to PETRY'S face". YOUNG got in the truck with PETRY and PAGE followed in DOUGLAS'S car. PAGE said the car was left at a hunting lease. PAGE said all three left in PETRY'S truck and drove to Midland, Texas. PAGE said PETRY was shot in Midland County, just outside the Midland city limit sign.

PAGE said YOUNG drove them to an oil lease. As PETRY paced back and forth, smoking a cigarette, PAGE said YOUNG shot PETRY in the head twice. PETRY'S body was left there. PAGE said they cleaned the truck out. PAGE grabbed the .22 shells, a butterfly knife and a pair of gloves. PAGE stuffed the .22 shells and the butterfly into a glove and threw them out in the field. YOUNG grabbed the tire tool and threw it out as well.

PAGE said after they left the oil lease, he told YOUNG to drop him off at the police station. Not knowing their way around Midland, YOUNG dropped PAGE off at an IHOP Restaurant. PAGE said he walked around for a long time before walking up to the county courthouse.

PAGE told this investigator that he did not shoot DOUGLAS or PETRY. PAGE said that he did not touch or pull the trigger on any of the weapons used to shoot DOUGLAS and PETRY.

POLYGRAPH SUBJECT IS: Suspect

PLACE AND DATE OF EXAMINATION: San Angelo Police Dept. – February 25, 2002

RESULTS: DECEPTION INDICATED

Investigation: HOMICIDE
Examinee: PAGE, David Lee (Jr.)
Polygraph #: R02-022

BRIEF SUMMARY OF RESULTS: Utilizing case information furnished by Investigator Luckie and information given by David Page, a polygraph examination was constructed and administered to PAGE. Evaluation of PAGE'S polygraph charts **did** reveal, to this examiner, significant criteria to indicate deception to the questions pertaining to knowledge of and/or actual participation in the offense.

The following relevant questions were administered to PAGE in the U-Phase (Zone) Comparison Test. Verbal responses given by PAGE, during the administration of this test, have been included along with the following questions.

DID YOU SHOOT DOYLE DOUGLAS?	**NO**
DID YOU SHOOT SAM PETRY?	**NO**
DID YOU FIRE A BULLET INTO EITHER DOYLE DOUGLAS OR SAM PETRY?	**NO**

PAGE, in the presence of his attorney and Investigator Luckie, was told the results of his polygraph test. This investigator told PAGE that he had not been truthful about his involvement. PAGE was told that he had not given investigators and his attorney complete details about what had happened or his direct involvement in the murders. PAGE commented that he knew what "it" was.

Irma Rodriguez
Irma Rodriguez
Polygraph Examiner

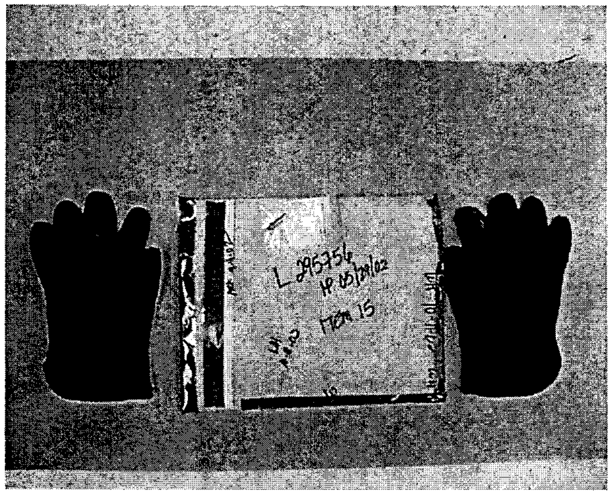
Article 4413 (29cc) Sec. 19A, VTCS forbids disclosure of any information contained in this report, except as provided by law.

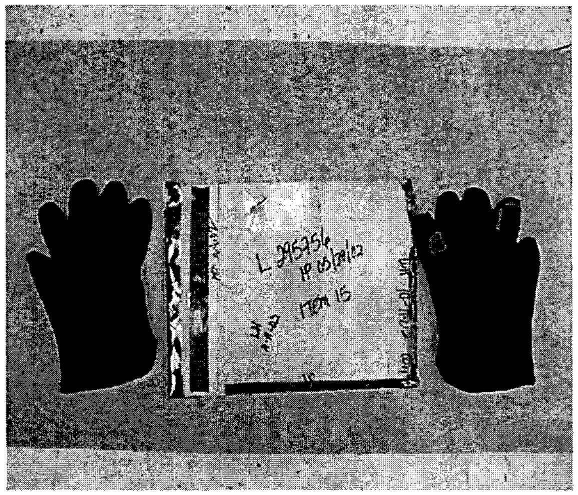
EXHIBIT
6

GSR Worksheet Item #15 L-295756 page 5 E 11/20/02

Defect #	Type of Garment	Location	IR	Visual/Micro	Nitrites * (Modified Griess)	Lead* (Sodium Rhodizonate)
None detected	Left hand cotton work glove	N/A	negative	Visual/micro.-negative *Several areas were "shiny" on fingertips	N/A	Several small spots on the middle back ofglove; one small spot on the edge; two small spots on the inner seam of thumb and forefinger (+) pressout None detected on the palm side ofleft glove
None detected	Right hand cotton work glove	N/A	negative	Visual/micro.-negative *Several areas were "shiny" on fingertips	N/A	negative

Lead(+) controls were done before testing.
Overall Notes: A pair of brown (cotton?) fabric gloves were submitted for GSR analysis. A note from Walter Henson, Latent Prints Examiner, on the submisison envelope stated a live cartridge was found in one of the gloves. Cartridge is consistent with certain 22 Long Rifle Federal LRN ammunition. Talked with DA, Midland CO, Al Schorre, about analysis for GSR. Asked that we conduct the analysis anyway. During visual/micro. eval. several shiny areas were located on both gloves on and around the back area and finger tips of the gloves. Maurice Padilla, DNA section was asked to perform analysis on several of these areas. Gloves were turned over and returned with several cut outs from the DNA section(see photo).
Results: Several small spots were located on the left glove that tested positive for lead. We were unable to identify the source of lead.





EXHIBIT

7

EXHIBIT NO. 2

STATE OF TEXAS

COUNTY OF MIDLAND

AFFIDAVIT OF R. R. VILLA

Before me, the undersigned, on this day personally appeared R. R. Villa, who being by me duly sworn, made the following affidavit:

"My name is R. R. Villa (nickname Ray-Ray). I am an adult male. My date of birth is October 2, 1963."

"In October of 2002, I was an inmate in the Midland County jail facility. I was at the central jail in B-Block. While I was there, I became acquainted with an inmate named David Page. We discussed many things; he told me that he and Clint Young were in jail involving the death of a man, last name Petry. Page told me that he killed Petry but was pinning it on Young because he, Page, did not want to get life in prison."

"I understand that I am giving an affidavit concerning this matter. I understand that I may be called as a witness to testify about what is in this affidavit and about my conversation with David Page. I state under oath that the matter within this affidavit are of my own personal knowledge and are true and correct."

Reynaldo Ray Villa
R. R. Villa

SWORN TO AND SUBSCRIBED TO BEFORE me, 25th April, 2003, Wilbur C McBrayer Jr, Deputy Sheriff in and for Midland County, Texas.

Wilbur C McBrayer Jr
Deputy ~~Sheriff~~

EXHIBIT

8

DECLARATION OF RAYNALDO RAY VILLA

I, Raynaldo Ray Villa, declare as follows:

1. In October 2002, I was an inmate at the new Midland County jail in Cell Block B.

2. When I was in custody, I met an inmate named David Page. Page and I were housed in the same cell block.

3. One day, I overheard Page tell another inmate that he had shot a man named Petrey.

4. The next day I asked Page about what I had overheard. While the two of us played cards and dominoes in his cell, Page told me that he had been charged with the kidnaping and murder of a man named Sam Petrey. Page stated that he, and not Clinton Young, had shot Petrey outside of Petrey's truck.

5. I remembering asking Page if he regretted what he had done. He never answered my question.

6. I overheard Page tell other prisoners that he had killed Petrey. While Page may have told others what happened in order to appear tough in prison, he did not tell me that story as a bluff because he knew it would not frighten me. I am a large man, weighing more than 300 pounds, and, have been incarcerated with

RV

inmates much tougher than Page.

7. Sometime after my conversation with Page, I was involved in a jail fight and assigned to lockdown at the old county jail on the third floor of the Midland County courthouse.

8. At that jail, I was assigned to a cell next to one occupied by Clinton Young.

9. Though we could not see each other because of the design of our adjoining cells, Young and I began talking about why were in custody. At some point I realized Young was the young man who had been arrested with Page.

10. I told Young that I knew about his case but I did not want to talk in front of the jailers and other inmates. I told him I would write him a letter and do what I could to help him prove his innocence in the kidnaping and killing of Petrey.

11. In March 2003, while still in custody, I wrote Young a letter about my conversation with Page. In that letter, I told Young that Page confessed to killing Petrey but was blaming it on Young because Page did not want to get sentenced to life in prison.

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12. In April 2003, I signed an affidavit for Young's defense about Page's confession.

13. Around May 2003, after I had served my time in custody, I received an unexpected visit at my home from Midland County District Attorney's Investigator J.D. Luckie.

14. I already knew Investigator Luckie because he had questioned me years earlier when I was prosecuted for taking about $200 in food stamps for my family when I was between jobs.

15. Luckie wanted to question me about my affidavit concerning Page. I told Luckie, as I had told Young in the letter, that Page had confessed to me that he had killed Petrey.

16. Luckie spent about five minutes or so asking me about the affidavit. He told me he did not think what I had to say would help Young in his defense.

17. I remember Luckie asking me, "Why are you trying to help this guy?" I told him, "Because he didn't do it. The other guy told me he did it."

18. Luckie asked me if I wanted to make a statement and I said I did.

19. I later signed a second affidavit prepared by Luckie that included my original comments about Page. The second affidavit also said that Page had

RJ
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bragged to other prisoners about shooting Petrey and suggested that Page was lying because he wanted to make himself seem tough in jail to other inmates.

20. I signed the second affidavit because it could be true that Page told other prisoners about the shooting to keep them from hassling him. But the original statement I made is also true: Page told me he killed Petrey and he did not tell me that to scare me off.

21. I am not trying to get back at anyone by making this statement. I am making it because I have been railroaded a lot in my life and believe that no one should be convicted for another person's crime.

22. On June 12, 2008, I spoke with two investigators from the Office of the Federal Public Defender. The investigators explained to me that their office represents Clinton Young in connection with a federal habeas proceeding. I have read and reviewed this four-page declaration.

I declare under penalty of perjury under the laws of the State of Texas that the foregoing is true and correct to the best of my knowledge and that this declaration was executed this 23rd day of September, 2008 in Midland, Texas.

Raynaldo Ray Villa

JULIO CAZARES
NOTARY PUBLIC
State of Texas
Comm. Exp. 08-21-2011

RV

EXHIBIT

9

JK.

[redacted] DECLARATION OF JAMES DANE KEMP

I, James Dame Kemp, declare as follows:

1. In September 2009, I was arrested for burglary in Midland, TX. I later pleaded guilty and was sentenced to one year.

2. I served the first part of my sentence in the Midland County Jail that was then on top of the country courthouse.

3. While I was in custody, I and two other inmates were accused of attempting to escape because we had been outside our cells. We were not trying to escape. We were only trying to get parts to build a tattoo gun that we used to make tattoos in jail.

4. We were charged with engaging in an organized crime with intent to escape the jail. I understood that charge to be a First Degree Felony that could result in a prison sentence of 5 years to 99 years on top of the sentence I already received for the burglary.

5. While I was awaiting trial on the new charge, I overheard one of my co-defendants, Michael Kessler, talking with another inmate named David Page. I knew Kessler. I did not know David Page personally, but I knew that Kessler and Page had been friends. From their conversation at the jail, I learned that Page had previously been convicted in the murder of a man whose car had been stolen.

JK

JK

6. Kessler and Page spoke for a long time, maybe two hours, by shouting into the ventilation system at the jail. I could hear the entire conversation. I remember that Kessler asked Page what he was doing back in Midland, and that Page said that he had been subpoenaed to testify at a court hearing for Clint Young.

7. I heard Page describe the events surrounding the shooting of a man whose car was stolen. Page said that the police never found fingerprints on the gun used in the shooting because Page had worn gloves the night it occurred.

8. I also remember Kessler telling Page that he must be upset because he helped the DA's case and was still given a long prison sentence. Page told Kessler he wasn't angry at all and that he had been lucky because if only the police knew what really had happened, he might have been facing capital murder.

9. Shortly after that conversation, Page was suddenly moved out of his cell and to another jail in Midland. And right after that, the deputies put Young in that same cell.

10. I later spoke to Young, also through the ventilation system. Young heard about the conversations that Kessler and I had with Page and I told Young that I would testify about what I heard David Page say. Clint said his lawyers would come speak with me the next day. I also heard Young talking to his family on a pay phone many times and crying that he did not kill the man whose car had been stolen.

11. The next day, two men called me out to speak with me and I assumed these men were Young's lawyers. They took me to an interview room where inmates talk to their attorneys.

JK
JK

They began asking me questions about my own case and told me I was looking at a lot of new prison time.

12. I realized these two men were not with the defense and I asked them who they were. They told me that they were with the District Attorney's Office. I also noticed that one of them had a small tape recorder in his shirt pocket and I asked him if I was already being recorded. He said he had been recording. I told him I did not think he had permission to record me without my approval and he said he did not need my consent.

13. At that point, I became concerned because I felt that the DA's office was trying to trick me. I already had told Clint I would go to court and tell them what Page had said. But then I started thinking about how the DA's people had come in and started questioning me. I thought to myself, if they can go in and start questioning you and recording you without your permission, what else can they do? I was intimidated.

14. I also knew that they had this other "escape" charge pending against me that could send me to prison for years when I was scheduled to get out on the burglary charge in months.

15. When I got to court, I was under pressure. The same two men who interviewed me at the jail were at Young's hearing the next day. I had to watch my words. I thought 'Hell no, I'm not going to risk my freedom by looking bad in front of the DA.' If I had been interviewed someplace other than in a courtroom, or not in front of these two men who had interviewed me previously, I would have been more clear-headed and would have remembered more; I was shaking the whole time I was up there, it was scary.

JK
JK

16. I have no reason to lie for Clint Young. I don't know him or David Page. I've never seen David and only saw Clint Young face-to-face when I came into the courtroom for the hearing, we spoke only through ventilators while we were in the jail and I've never met him before and haven't spoken to him after.

18.Within a week or so of my testimony in Young's case, my attorney, Rusty Wall, came to me with a plea deal. He told me that the First Degree Felony had been reduced to a Fourth Degree and that I would receive a 10-month sentence that would run concurrent with the burglary sentence that I was already serving. So I accepted the plea and was out in several months. The prosecutor in both of my cases was Theresa Clingman.

I declare under penalty of perjury under the laws of the State of Texas that the foregoing is true and correct to the best of my knowledge and that this declaration was executed this 23 day of February, 2014 in Midland, Texas.

JAMES DANE KEMP

SIGNED Before me the 23rd of Feb. 2014

James Kemp

ANNE MARIE CARTER
My Commission Expires
July 3, 2016

NOTARY PUBLIC
STATE OF TEXAS

Anne M. Carter
Midland, Midland Co. Tx.

JK
JK

EXHIBIT
10

DECLARATION OF JOHN HUTCHINSON

I, John Hutchinson, declare as follows:

1. In 2010, I was held in custody at the Midland County Jail after my arrest for violating parole in Colorado.

2. During my time at the jail, above the county courthouse, I heard another inmate talking through the air vents and bragging about how he had shot and killed another man.

3. The other inmate was David Page and he talked about how he shot this man twice in the head with a .22 caliber handgun while his accomplice was asleep because he had been doing drugs.

4. I remember Page originally saying he had done the killing of this man but then he later started to back away from that story and made it sound like he was not responsible for the killing.

5. I also remember Page saying that he got a good deal because the other guy involved in the crime was on Death Row.

6. From my cell, I could see the corridor where they would take people out of the maximum security area and I saw Page being led out of the jail.

7. After Page left the jail, the guards brought in another inmate and he also was talking about why he was in Midland. He said he was convicted of capital murder but was innocent.

8. I remember that this second inmate said he was asleep when the murder occurred and what he said clicked with me because I remember that Page had talked about how his accomplice was asleep when he murdered the man.

9. I later learned that the second inmate was Clint Young but did not ever see him until I was called into court during his hearing on the appeal of his conviction.

10. During that hearing, I was brought into court along with other inmates who had overheard what Page was saying while he was at the Midland County Jail.

11. Before I went to court, I was taken to an interview room above the courthouse and questioned by two investigators with the District Attorney's Office.

12. I remember that they asked me questions that seemed like they wanted to protect Page.

13. The investigators got mad because I wouldn't talk to them and I remember that one of them was a big guy who was rude as hell and tried to secretly tape record me by putting a recorder on a book shelf and trying to hide it behind his arm.

14. When I wouldn't talk to them, the investigators got real angry and left the room and I could hear them outside the room cussing.

15. The whole experience of going to court for the hearing was kind of scary and I was nervous.

16. Though I saw Page in the jail before I testified in court, I had never seen Young before I came to court and did not know either one of them before this whole period of time in the Midland County Jail.

I declare under penalty of perjury under the laws of Texas that the foregiong is true and correct to the best of my knowledge. Signed this 24 day of FEB, 2014, in Midland, TX.

John Hutchinson

SWORN TO AND SUBSCRIBED by the said JOHN HUTCHISON on this the 24th day of February, 2014.

Nancy L. Piette

NOTARY PUBLIC STATE OF TEXAS

NANCY L PIETTE
My Commission Expires
April 30, 2016

STATE OF TEXAS

EXHIBIT
11

21 July 2015

Ms. Margaret A. Farrand
Federal Public Defender - Central District of CA
321 East 2nd Street
Los Angeles, CA 90012-4202

RE: MT14-0304 – Clinton Young v. William Stephens, 5th Cir. appeal no. 14-70011

Dear Ms. Farrand,

We have completed our analysis of the gloves received by our laboratory with respect to the above referenced case. This report describes our analytical methods, documents our results, and discusses the conclusions we have drawn from them.

Samples

An evidence envelope (Figure 1) labeled "Two Brown Gloves, Cass #1 Lease" DPS 010124479, 01-09968 was received on 13 May 2015 this package contained:

- Left and right gloves, packaged together in the same envelope (Figures 2-3).

Tasks

- Determine if gunshot residue particles (GSR) are present on the gloves.
- Determine if the gloves show evidence of usage. Specifically, attempt to determine if the gloves show evidence of wear from gardening activities.

Analytical Approach

Initial Examination and Documentation

Images of the front and back surfaces of each glove are shown in Figures 2 and 3. An examination, by means of the stereomicroscope, of the exterior surfaces of both gloves shows that they are relatively free from extraneous particles. More specifically, no potential deposits of soil clumps, plant tissue or mineral grains were observed on or between the woven yarns comprising the fabric. Close inspection of the yarns, themselves, reveals that they are, for the most part tightly woven. The palmer surfaces were compared to the backs of gloves in an attempt to determine if any differences due to wear (abrasion by contact and rubbing) could be observed between the normal contact and non-contact surfaces of the gloves. Careful attention was paid to the tightness of the yarns and unravelling of the fibers. No demonstrable differences in these properties were noted between the surfaces of the individual gloves or between the two different gloves.

Small fiber samples were plucked from different regions of both gloves so that they could be identified and examined by polarized light microscopy. This examination revealed that the gloves are woven from cotton yarns. The fibers on the outsides that appear black macroscopically are found to consist of blue-green dyed cotton while the cotton fibers from the red lining are simply colored with red dyes. No evidence of extensive wear was observed on any of the fibers examined in this manner.

The damage to the right glove (illustrated in Figure 3) was present when it was removed from its packaging in our laboratory. Its cause had not been investigated by us.

Sampling

Samples were initially collected from the front and back of each glove using adhesive carbon tabs mounted on aluminum pins. A room blank was opened and exposed to room air during sampling to serve as a control. All five SEM[1] stubs were carbon coated at the same time.

A second set of samples was collected by cutting squares of approximately 1 inch on a side from the back surface of each glove near the thumb (Figure 4). This fabric swatch was suspended in a plastic centrifuge tube and sonicated for 15 minutes in ethanol. The fabric swatch was removed from the ethanol solution and the remaining solution was spun down in a centrifuge. The mass of loose fibers was removed from each tube using a clean glass rod. The solution was again centrifuged for five minutes at which time the solution was filtered through a 0.2 µm polycarbonate membrane filter. Filters were prepared from both swatches, as well as the ethanol blank and processed under the same conditions as the samples. The resulting three filters (left glove, right glove and blank) were mounted on adhesive carbon and carbon coated together.

Each sample was analyzed using an automated GSR routine in the SEM using energy dispersive x-ray spectroscopy (SEM/EDS).

Results

The automated particle analysis results were evaluated for the presence of tricomponent GSR particles[2]. Table 1 provides a summary of tricomponent particles confirmed in each sample.

An EDS spectrum and image of each tricomponent particle is presented in Figures 4-9 (adhesive sampling) and Figures 10-15 (from sonication of the fabric). Each of the images and spectra shown are based upon a return to the auto-identified GSR particle followed by reanalysis. A typical barium sulfate particle from each glove is presented in Figures 16 and 17. After the

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[1] Scanning electron microscope

[2] That is particles, which contain the three elements: Lead (Pb), Antimony (Sb) and Barium (Ba). These three elements, when found together in a single spherical to rounded particle, are considered to be characteristic of the primer residue resulting from the discharge of a cartridge in a firearm.

barium sulfate crystals, the next most commonly detected particle type is composed primarily of iron. These may be rust or iron or steel particles but they have not been analyzed further.

Table 1. Summary of tricomponent particles detected in each analyzed stub.

	Adhesive Stub Sampling*			Sonication and Filtration Sampling		
	Back Left	Back Right	Control	Back Left	Back Right	Control
PbBaSb**	3	3	0	3	3	0
$BaSO_4$	ND	ND	0	1389	762	0
Fe-rich	ND	ND	2	214	308	11
Total Particles	ND	ND	3	2000	2000	37
Total Frames	2307	1417	1641	64	39	2184

*The total number of particles and the number of barium sulfate particles are listed as not determined (ND). The large number of fibers on the adhesive stubs resulted in extensive charging and movement of particles, which resulted in a significant number of spectra that do not contain data (due to shifting of the particles during analysis).
**The tricomponent particles tabulated above were confirmed through a manual reanalysis of each one of them.

A general evaluation of the remaining particle types (elemental compositions) detected in these samples shows a variety of particles, most of which are relatively small, i.e., <10 µm in diameter.

Summary and Conclusions

The results of our analyses show that:

- Tricomponent particles characteristic of gunshot residue were detected in each of the two samples collected from each glove.
- The presence of large numbers of fine barium sulfate crystals[3], detected on both gloves, is consistent with work in oil well drilling, since barium sulfate is a common additive to oil drilling lubricants.
- Had the gloves have been used in a garden, we would have expected to find some evidence of soil (organic matter and mineral grains) on them. Stereomicroscopical examination of both gloves (inside, outside, back of hand and front of hand) show no detectable evidence of soil. While some silicate minerals were detected by EDS, those particles are relatively small (<10 µm) and are present in a relatively low concentration on the glove. Based on these results, while there is evidence of only light wear to the gloves, the major indicator of use is the presence of the small crystals of barium sulfate embedded in the fabric.

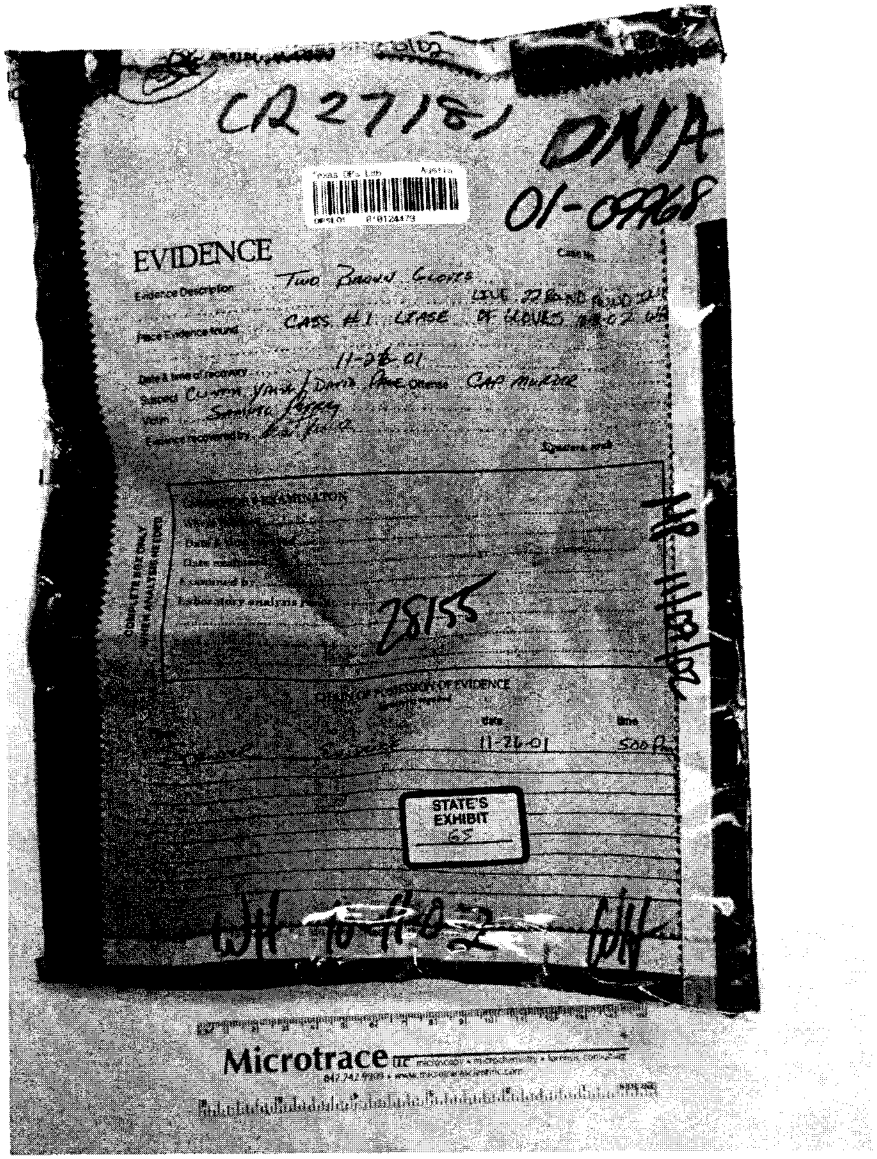
[3] Barium sulfate is a common additive to oil well drilling fluids.

If you have any questions concerning this report, or if we may be of further assistance, please do not hesitate to contact either of us directly. Thank you for consulting Microtrace.

Sincerely,

Christopher S. Palenik, Ph.D.
Research Microscopist

Skip Palenik
Senior Research Microscopist



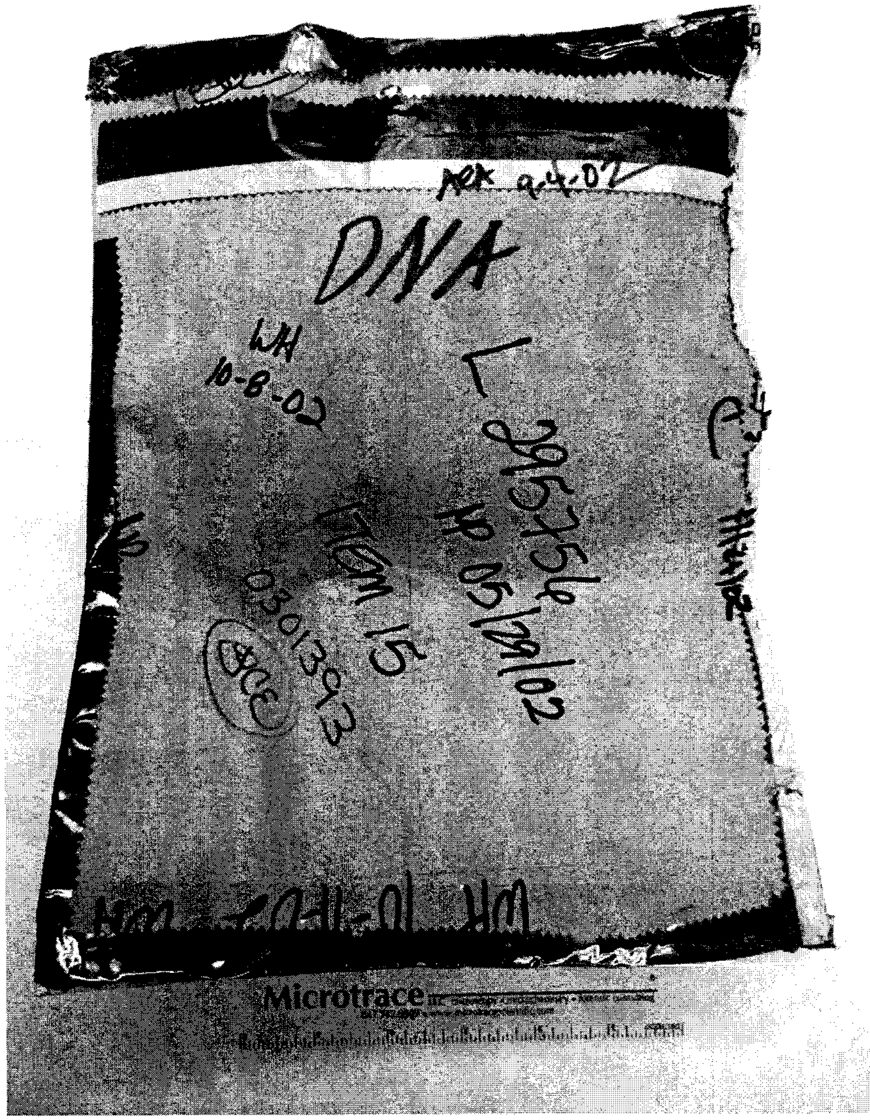


Figure 1. Evidence package shown from both sides, as received. Labeled "Two Brown Gloves, Cass #1 lease" DPS 010124479, 01-09968.

A B

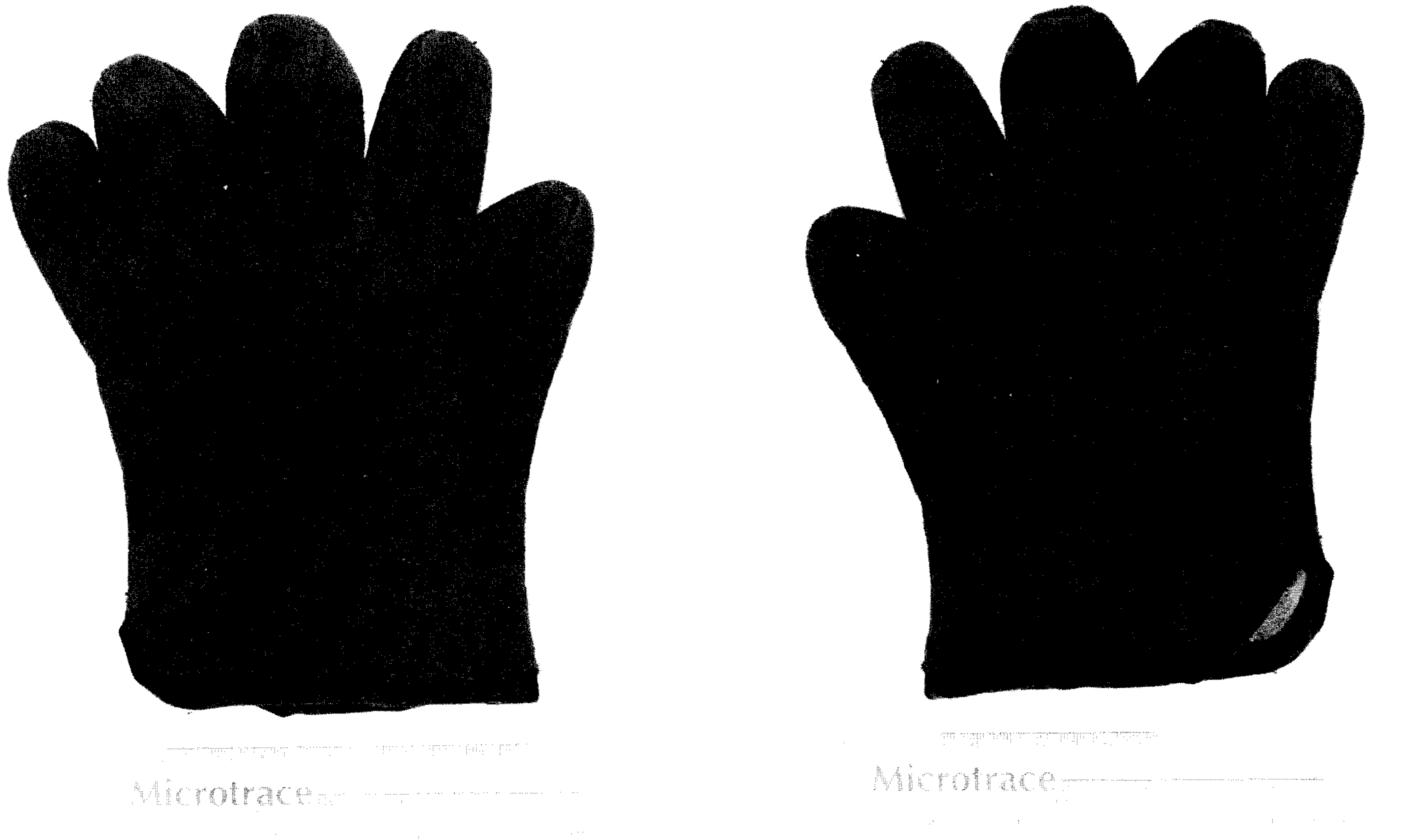


Figure 2. Left glove shown from (A) back side of hand and (B) inside of hand.

A B

Figure 3. Right glove shown from (A) back side of hand and (B) inside of hand.

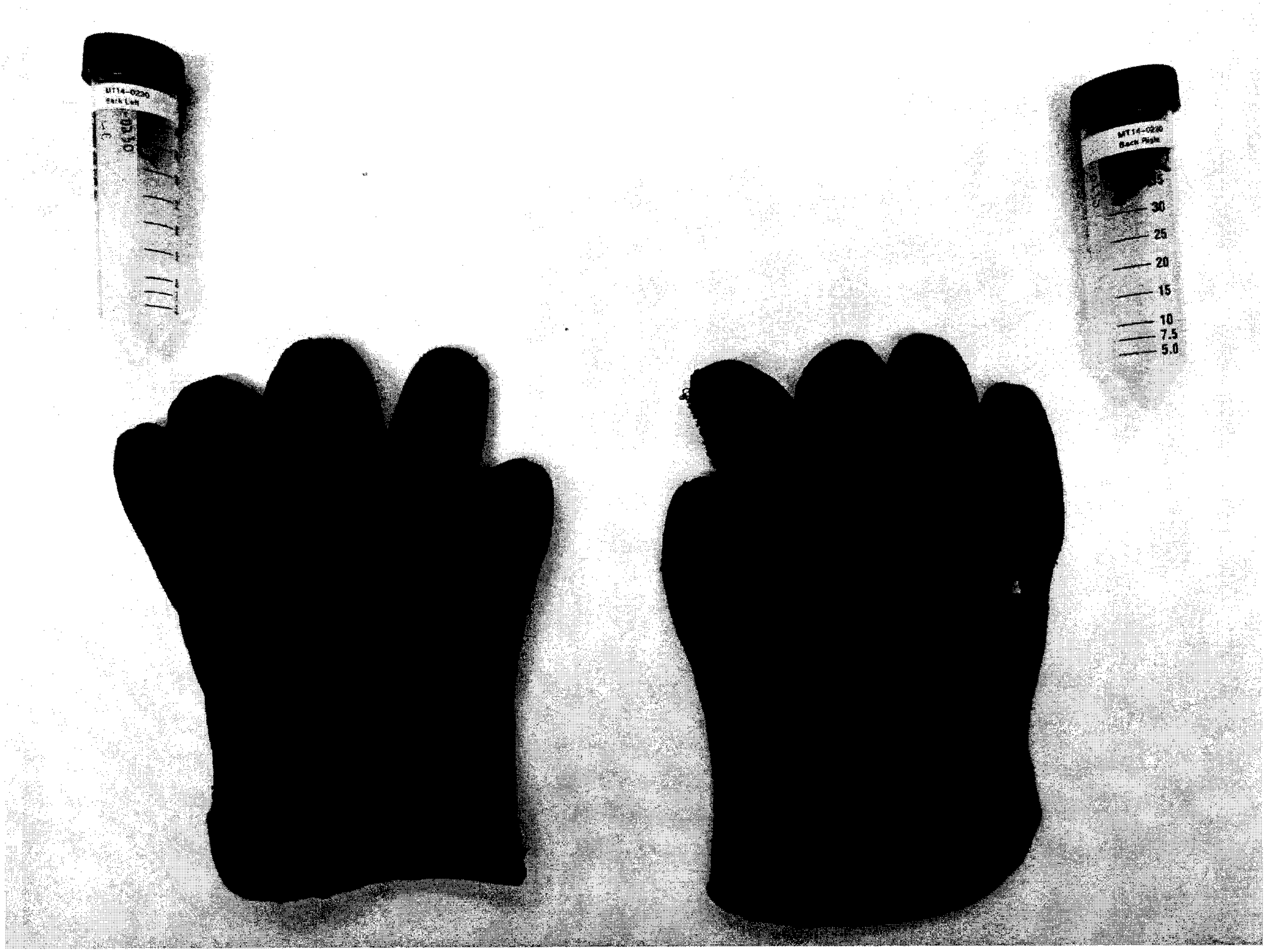
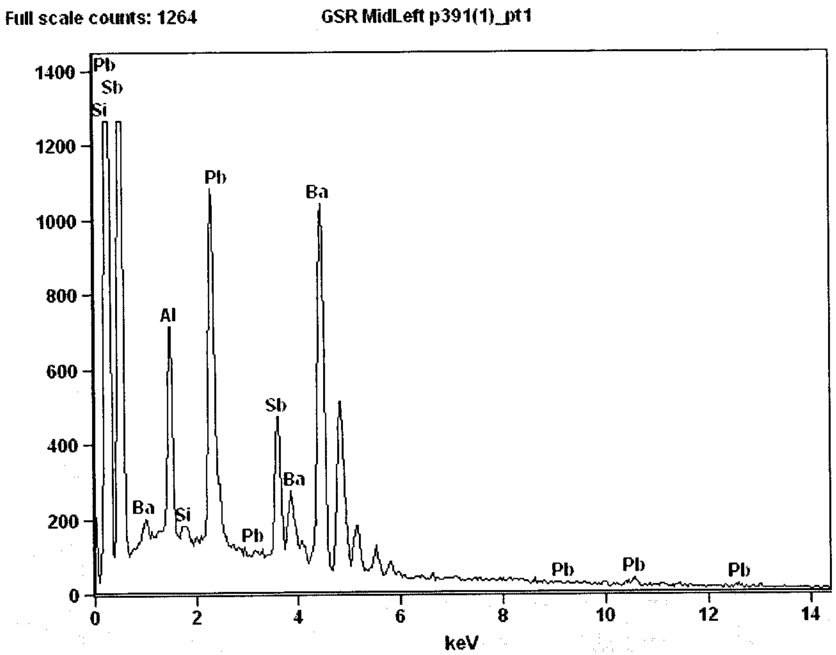


Figure 4. The backsides of the two gloves after removal of the approximately one square inch pieces..



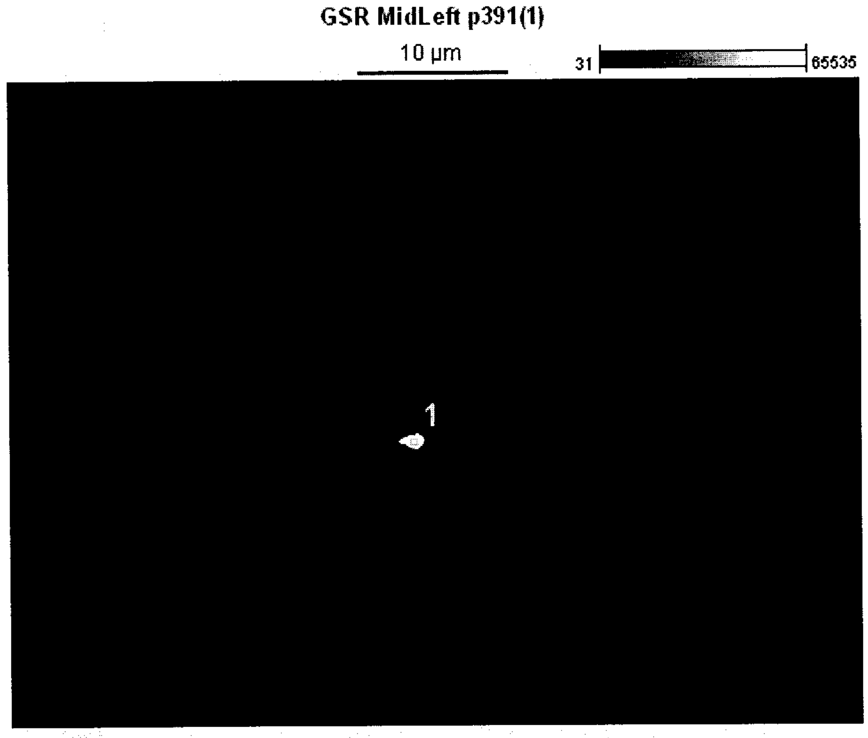
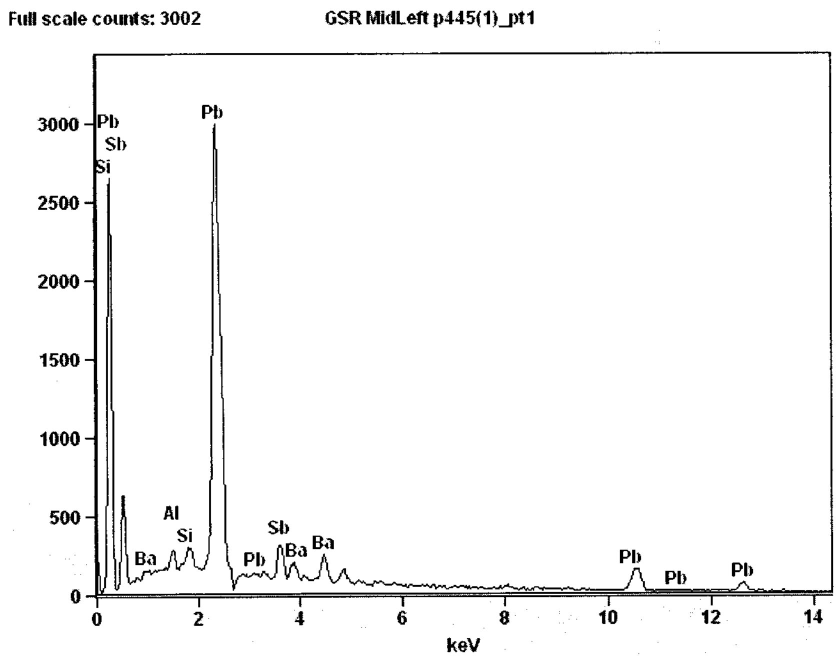


Figure 5. Tricomponent particle from adhesive stub sampling, Right Glove (particle 39).



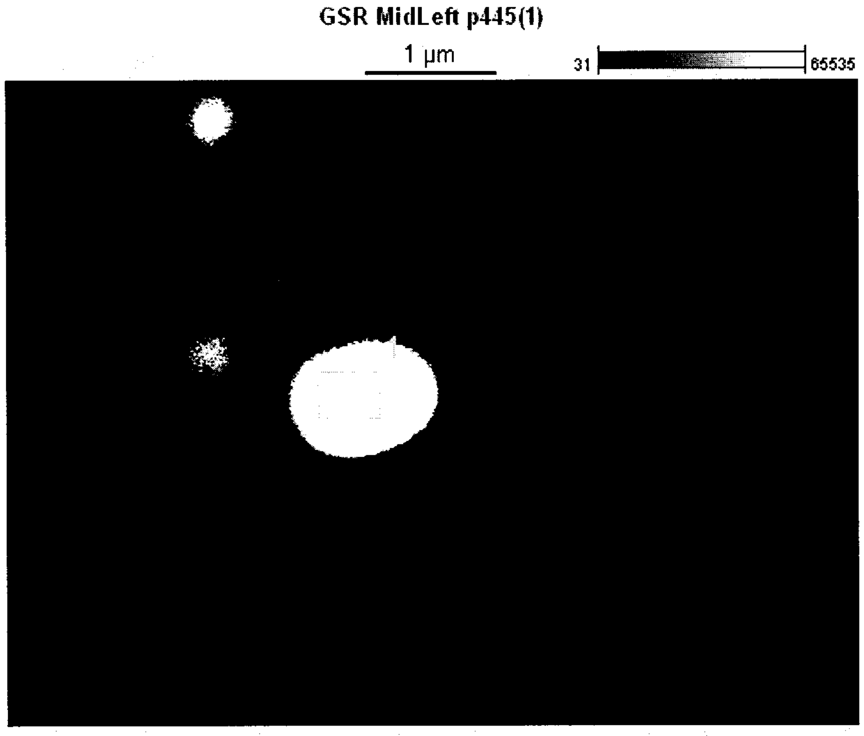
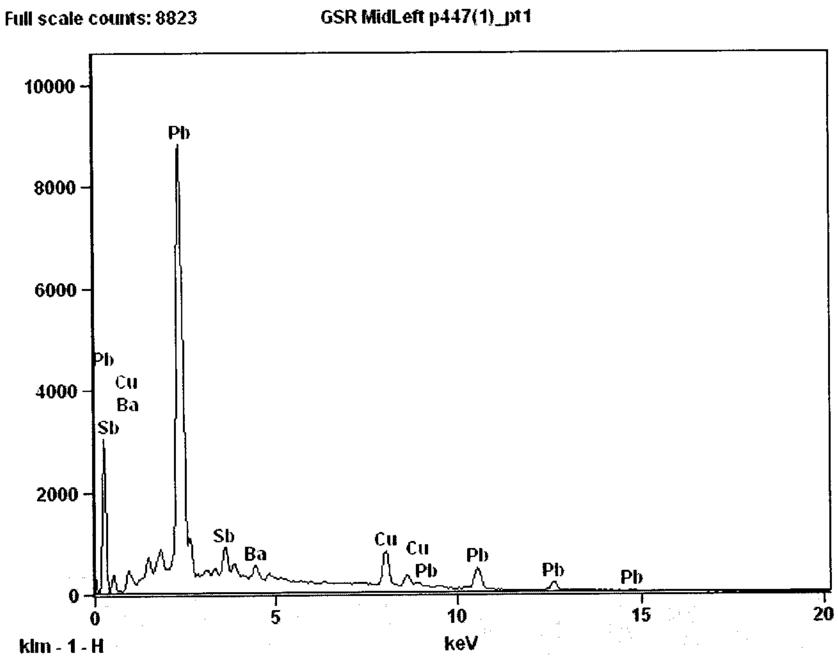


Figure 6. Tricomponent particle from adhesive stub sampling, Right Glove (particle 445).



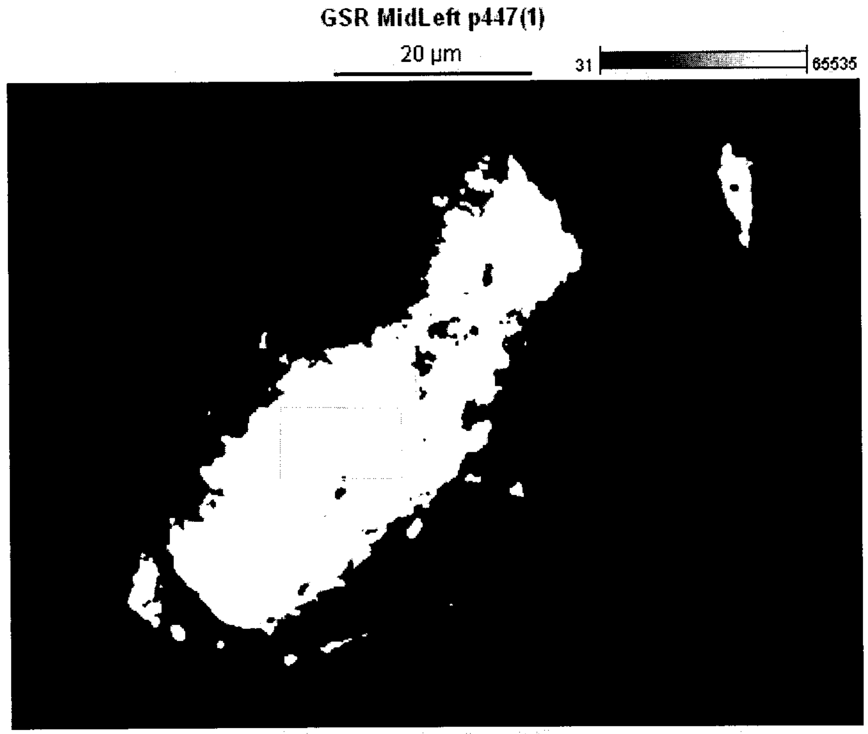
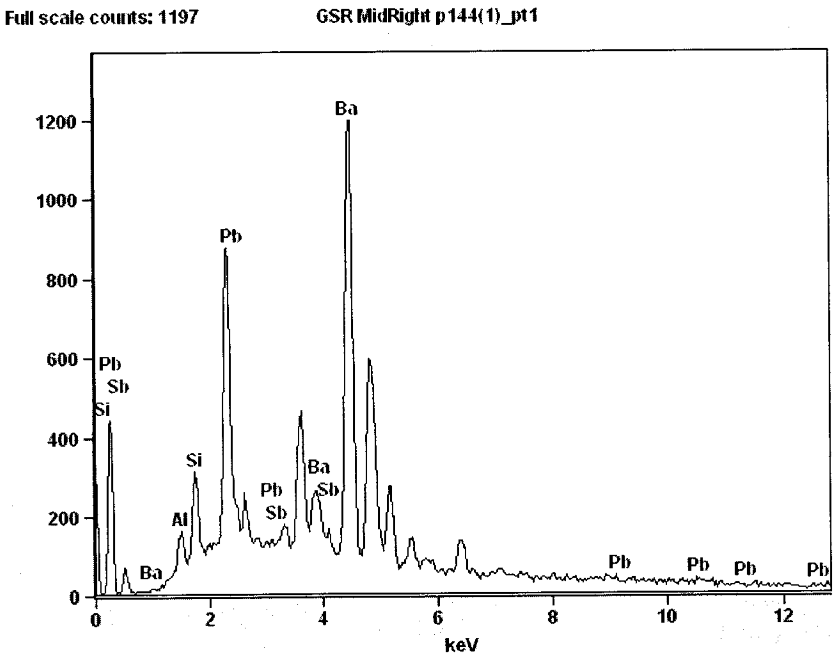


Figure 7. Tricomponent particle from adhesive stub sampling, Right Glove (particle 447).



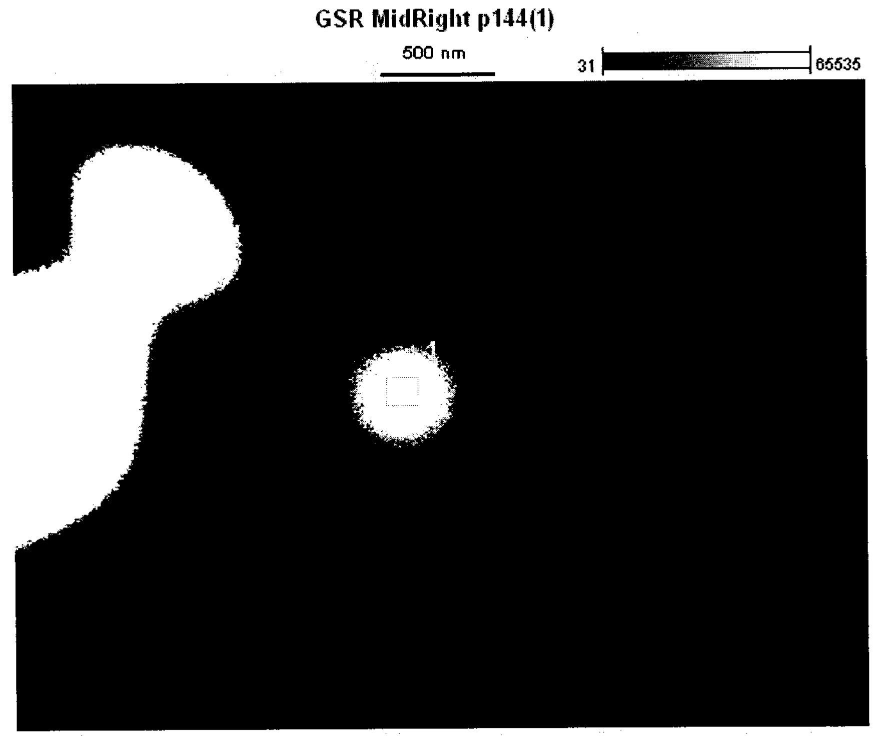
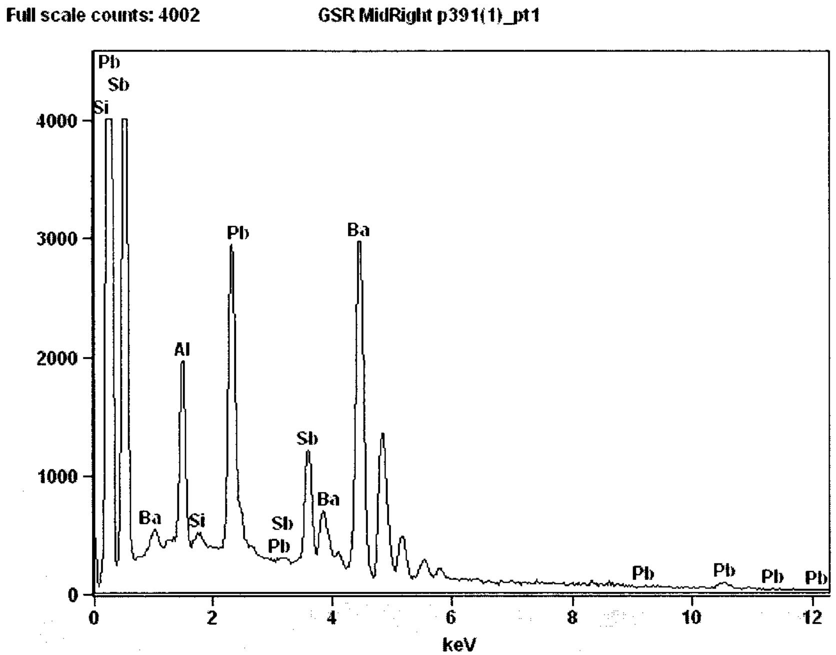


Figure 8. Tricomponent particle from adhesive stub sampling, Left Glove (particle 144).



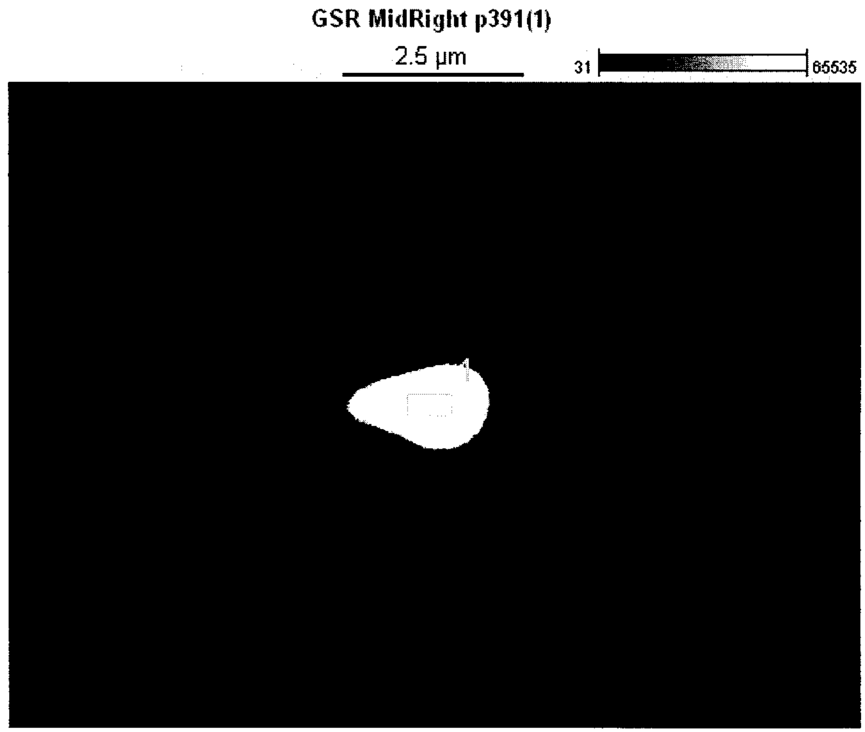
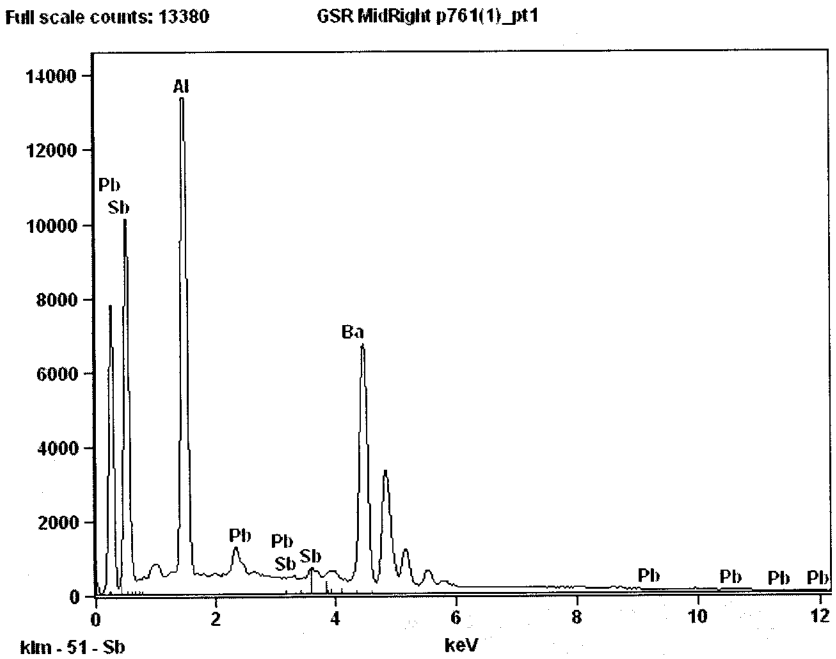


Figure 9. Tricomponent particle from adhesive stub sampling, Left Glove (particle 391).



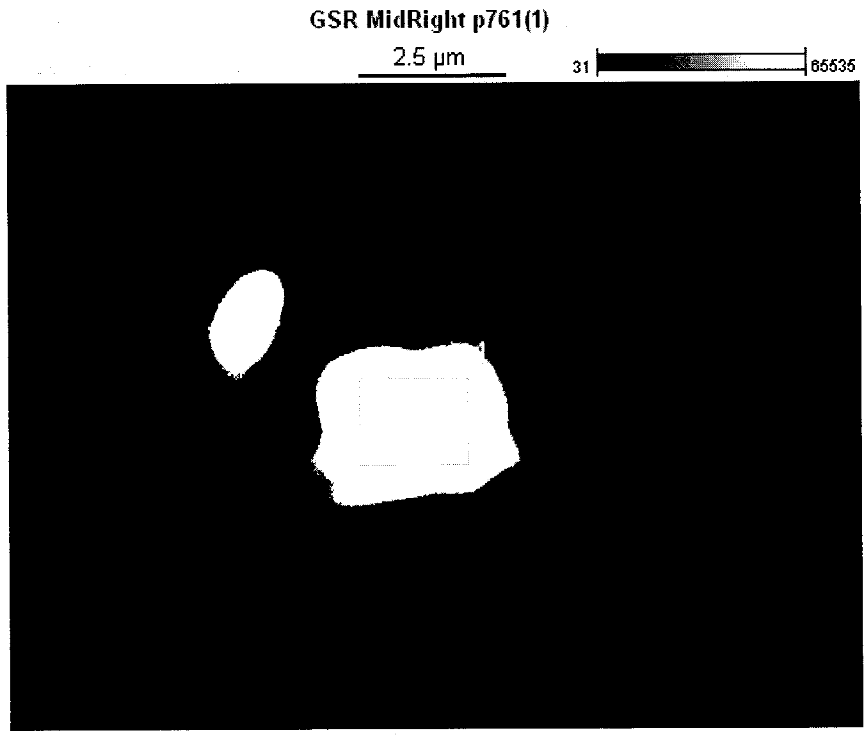
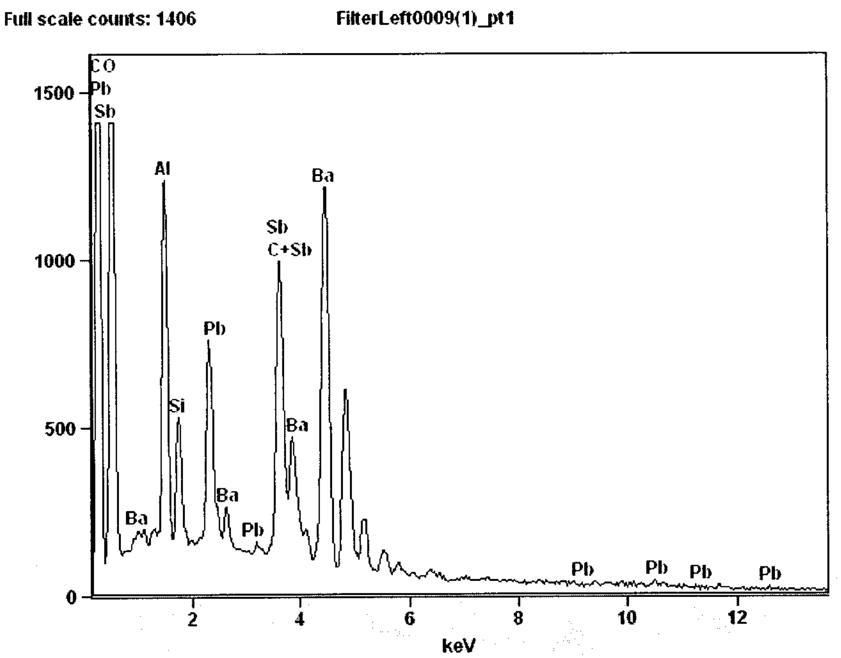


Figure 10. Tricomponent particle from adhesive stub sampling, Left Glove (particle 761).



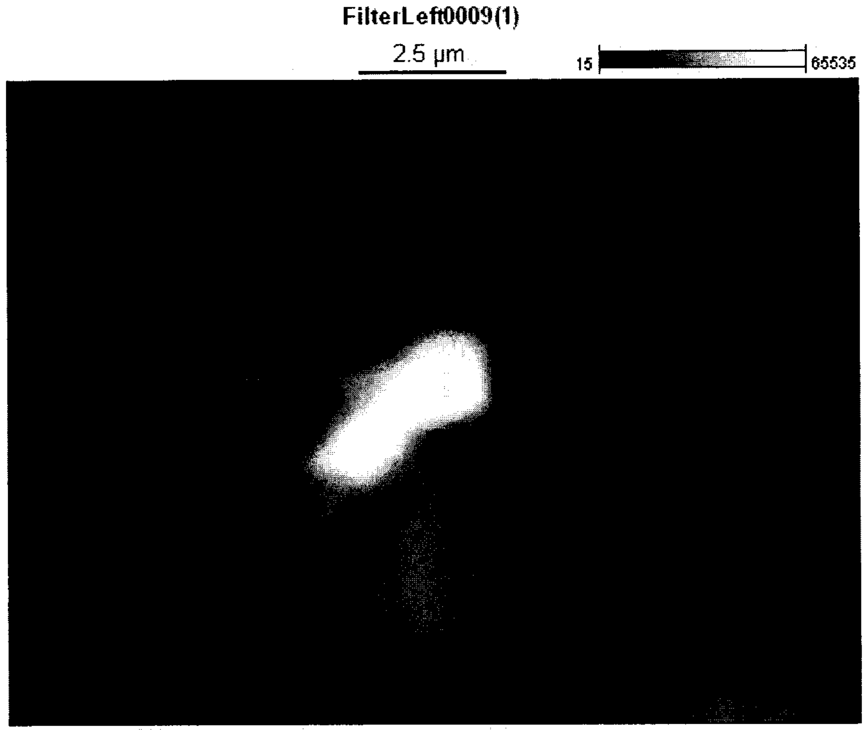


Figure 11. Tricomponent particle from sonication/filtration sampling, Left Glove (particle 009).

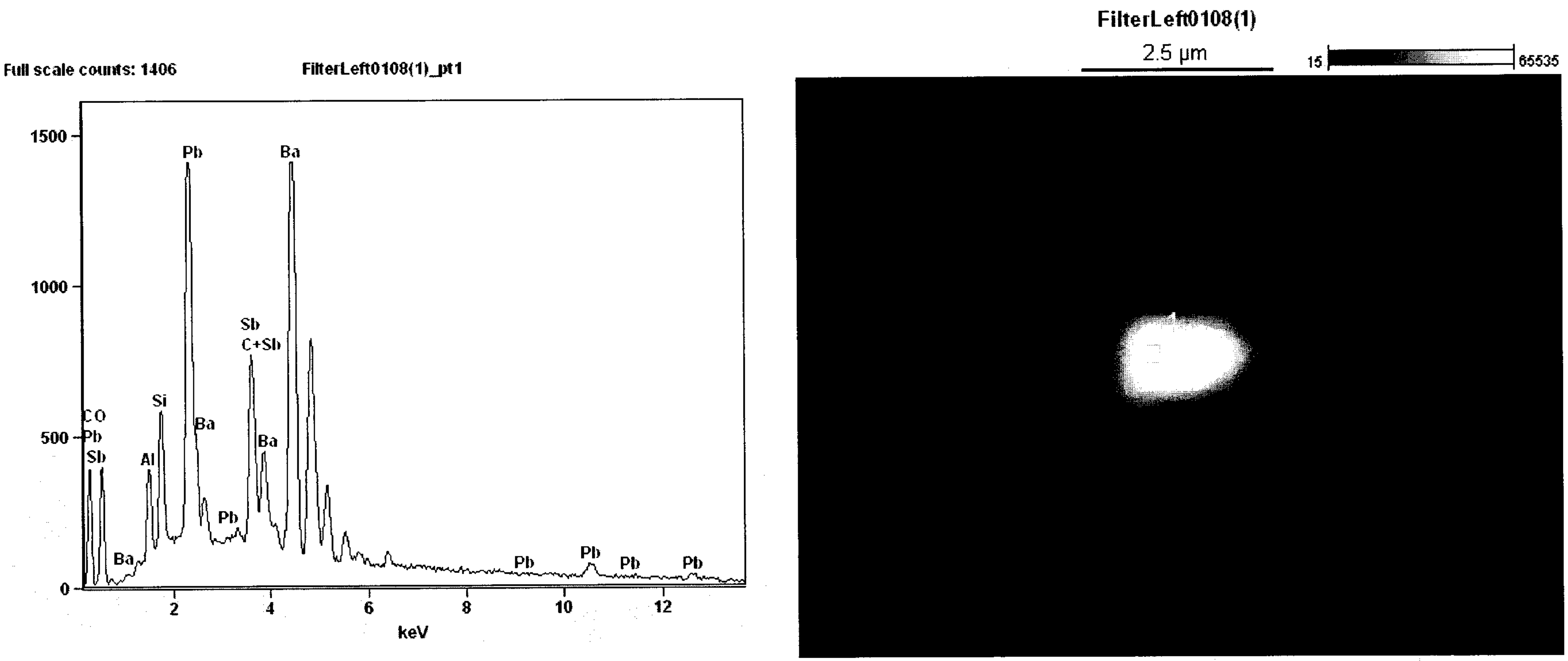
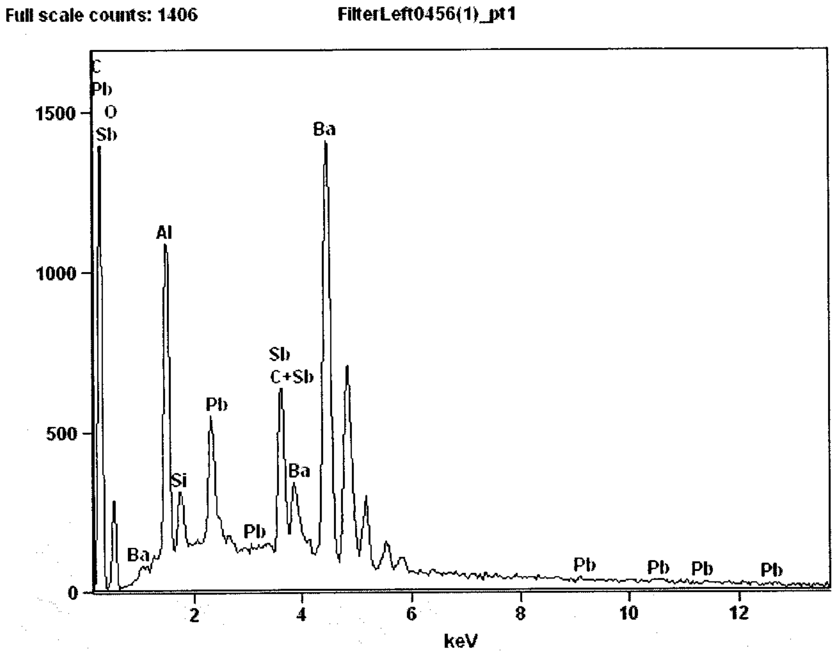


Figure 12. Tricomponent particle from sonication/filtration sampling, Left Glove (particle 108).



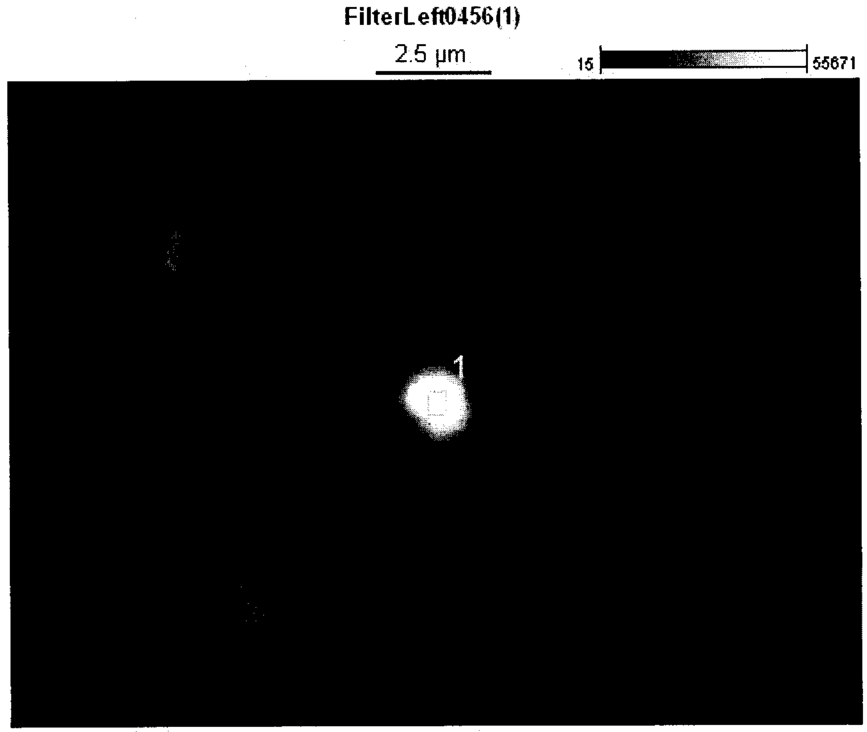
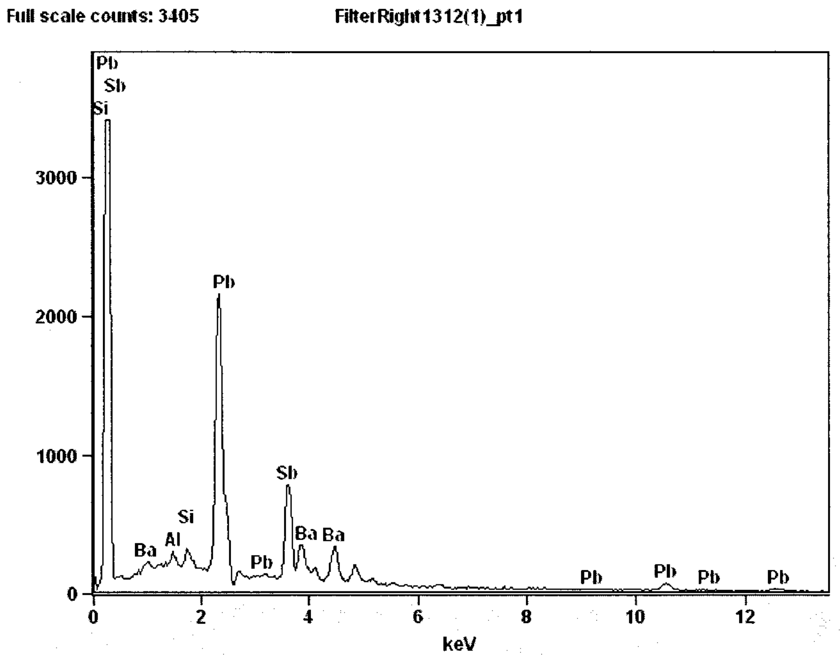


Figure 13. Tricomponent particle from sonication/filtration sampling, Left Glove (particle 456).



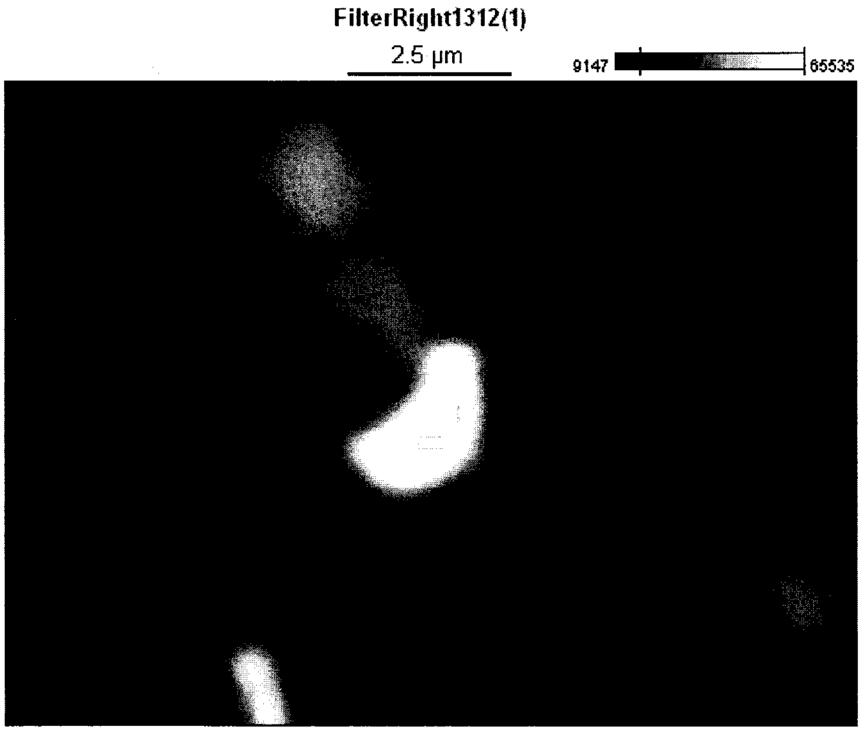


Figure 14. Tricomponent particle from sonication/filtration sampling, Right Glove (particle 1312).

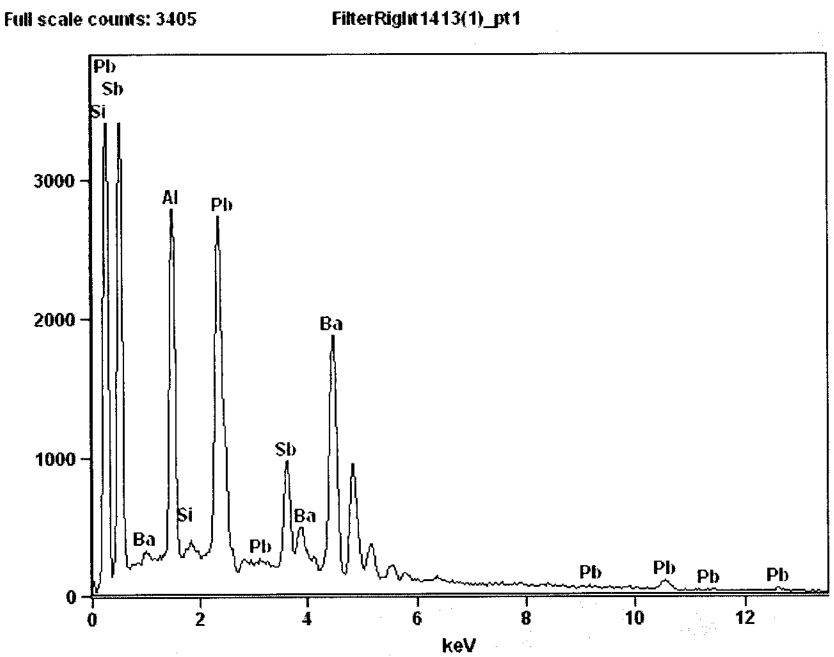


Figure 15. Tricomponent particle from sonication/filtration sampling, Right Glove (particle 1413).

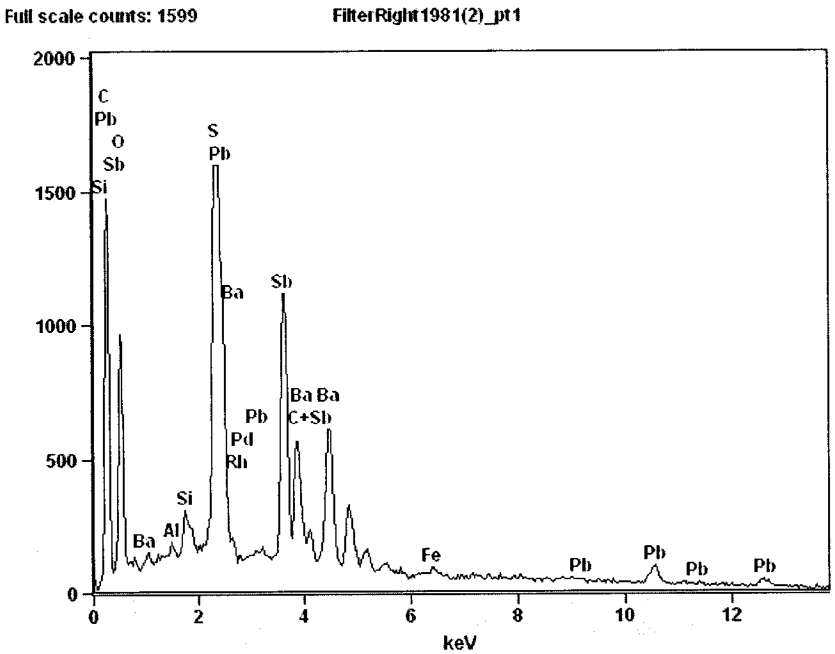


Figure 16. Tricomponent particle from sonication/filtration sampling, Right Glove (particle 1981).

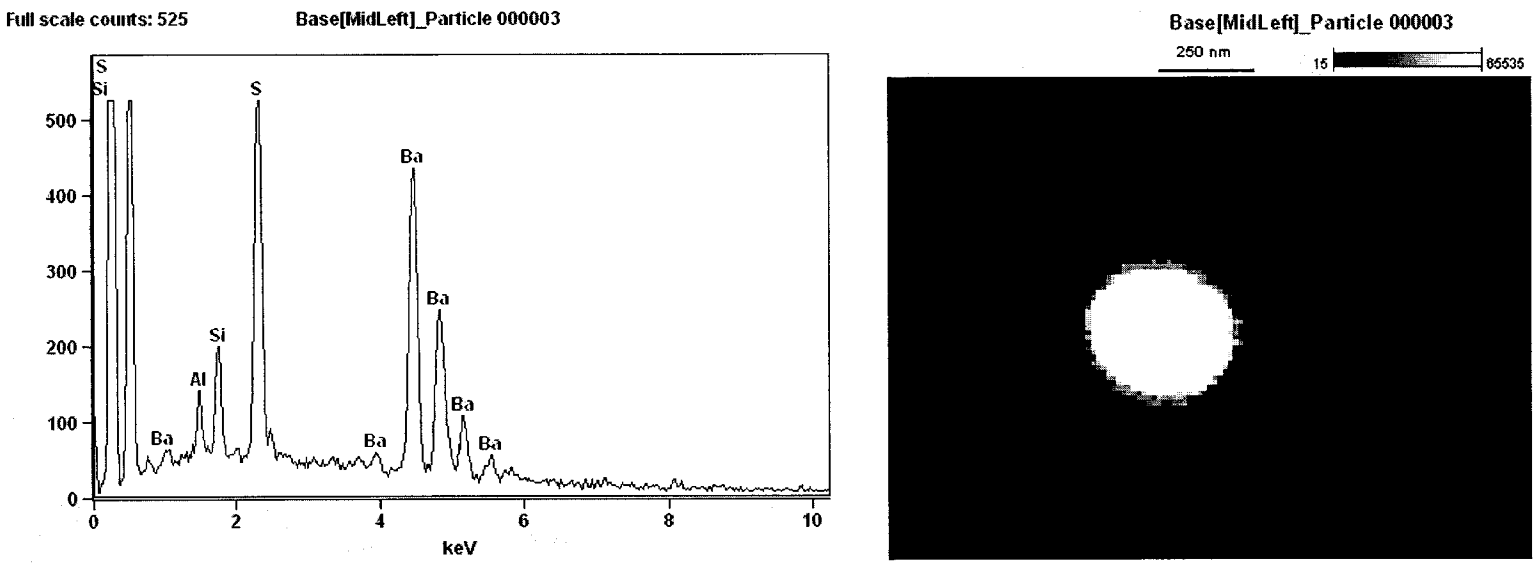
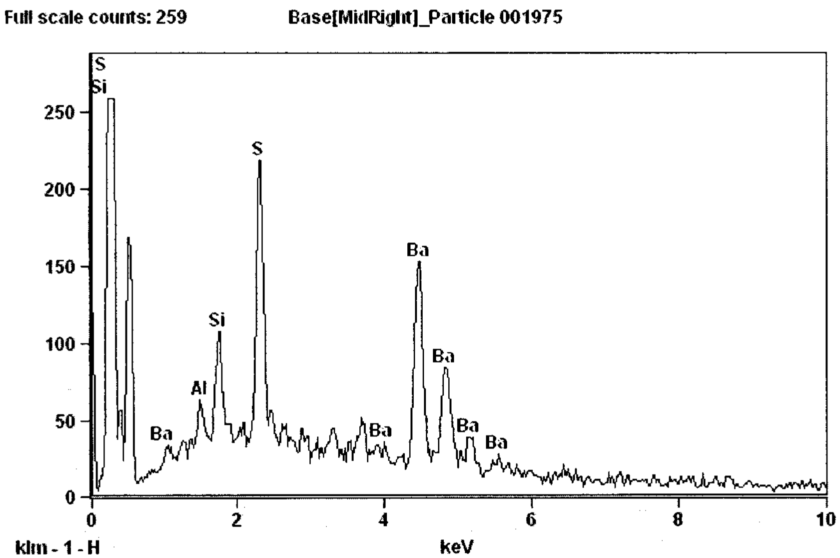


Figure 17. Barium sulfate particle from sonication/filtration sampling of the Left Glove (particle 0003).



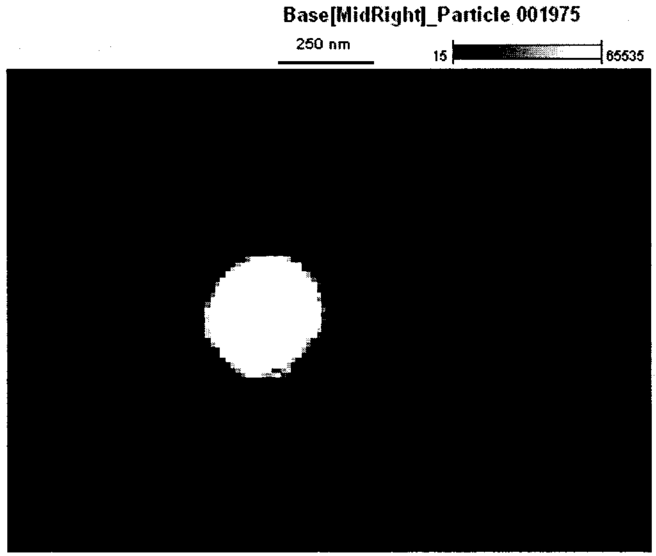


Figure 18. Barium sulfate particle from sonication/filtration sampling of the Right Glove (particle 0003).

EXHIBIT

12

DECLARATION OF CHRISTOPHER S. PALENIK, Ph.D.

1. I, Christopher S. Palenik, Ph.D., do hereby declare the following to be true and correct, under penalty of perjury.

I. CREDENTIALS AND RETENTION BY COUNSEL

2. My credentials are laid out in depth in my current curriculum vitae ("c.v."), a true and correct copy of which is attached to this declaration as Exhibit A.

3. Our laboratory, Microtrace LLC, has been retained by counsel for Clinton Young to perform microanalysis and gunshot primer residue (GSR) testing on certain items of evidence that were submitted at Mr. Young's 2003 capital murder trial: *State of Texas v. Clinton Young*, Midland County District Court, 238th Judicial District, case number CR 27-181.

4. In July 2015 Samuel "Skip" Palenik (my father) and I examined and analyzed a pair of gloves (labeled as "Two Brown Gloves, Cass #1 Lease, DPSL01 010124479, 01-09968) that was provided to us by the Midland District Attorney's Office, which I understand were introduced into evidence at Mr. Young's trial. We described the results of our testing in a report dated July 21, 2015, which we provided to Mr. Young's counsel. I helped to conduct the testing described in the July 21, 2015 report and signed the report along with my father. As explained in the July 21, 2015 report, the analysis revealed the presence of GSR on each of the submitted gloves.

II. PURPOSE OF THIS DECLARATION

5. The purpose of this declaration is to provide further explanation of the methods we used to test the gloves for GSR in July 2015 and to explain how further testing could provide additional information relevant to the issues in Mr. Young's case.

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6. I have been informed that one of the issues in Mr. Young's case is the identity of the person who shot victim Samuel Petrey. I understand that only two people, Mr. Young and David Page, were present when Mr. Petrey was shot and that Mr. Young contends that Mr. Page was the shooter. I understand that the gloves I tested in 2015 were owned by Mr. Page. I further understand that the purpose of Mr. Young's counsel in requesting further testing of the gloves for GSR is to obtain additional scientific evidence that may help to clarify the involvement of Mr. Young in the shooting.

III. LIMITATIONS OF PRIOR TESTING

7. When we tested the gloves in 2015, our purpose was to determine whether or not GSR was present on the gloves. This testing did not attempt to determine the total number of GSR particles on the glove and did not attempt to compare the relative amounts of GSR on various areas of the gloves.

8. For typical GSR analyses, which are based upon presence/absence results, the forensic GSR community generally considers the presence of three or more tri-component GSR particles (*i.e.*, particles that contain lead, barium, and antimony) to be an indicator that an item was in the vicinity of a discharged weapon or made contact with a GSR related item. In our 2015 testing of the gloves, the GSR analysis was halted upon the identification of three tri-component GSR particles (although additional GSR particles may be present). A threshold of three tri-component GSR particles is considered a relatively conservative threshold for a positive GSR result, as many labs utilize a threshold of one tri-component particle as a positive indicator, and to my knowledge, only one laboratory uses a higher threshold.[1]

[1] The US Army Crime Laboratory (USACIL) utilizes a more conservative threshold of four particles due to the fact that military operations are often conducted in environments that may have higher background levels of GSR.

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9. Given that the 2015 analysis provides results only in terms of presence or absence, the results do not provide any potential for insight into the distribution or relative quantities of GSR particles on various parts of the glove.

IV. PROPOSED SUPPLEMENTAL TESTING

10. It is my understanding that the state asserts that the GSR reported in the July 2015 Microtrace report may have resulted from cross-contamination[2] as opposed to being deposited on the gloves while being worn by the shooter during the discharge of a firearm. I understand that Mr. Young's attorneys wish to conduct further testing of the gloves, in an attempt to better constrain the origin of the detected GSR particles. In an attempt to address this question, I propose the supplemental analysis approach described below.

11. Mr. Young's counsel have asked me to consider the following two scenarios: a) the GSR on the gloves resulted from the gloves being worn by a shooter during the discharge of a weapon, or instead b) the glove was on the floor, in the back of a vehicle, when a firearm was discharged in a vehicle, or the gloves were introduced into the back of the vehicle after the firearm was discharged. A detectable difference between the relative concentration of GSR on various areas of the gloves provides a means by which it may be possible to distinguish between these two scenarios.

12. We hypothesize that a difference between the relative concentration of GSR on various areas of the gloves is probative of the GSR's origin, for two reasons. First, GSR deposited from the discharge of a weapon would most likely be unevenly distributed on the glove (*i.e.*, higher concentrations would be deposited in areas exposed during discharge, while lower concentrations would be

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[2] Within this declaration, the term "cross-contamination" is used to include the deposition of GSR onto the gloves by any circumstances within the context of this case other than that in which the glove was worn by the shooter at the time of weapon discharge.

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deposited in areas that are shielded during discharge). Second, it is anticipated that GSR deposited from the cross-contamination scenario would be more evenly deposited on the exposed surfaces of the gloves.

13. To determine whether there is, in fact, a higher relative concentration of GSR in areas of the gloves that would be exposed during discharge of a weapon, I propose to analyze the following areas of each glove:

- Area A: The area of the gloves between the second (index) and third fingers. Due to the bulky nature of the gloves (see Figures 2 and 3 of the 2015 Microtrace report), this area is relatively protected and would be unlikely to be exposed to cross-contamination if the gloves were lying on a surface or worn while performing many ordinary tasks. However, if a glove was worn on a hand used to discharge a firearm, the area between the second and third fingers would be exposed during the trigger operation and subject to the possible deposition of the GSR during the discharge event.

- Area B: The area between the third and fourth fingers. It is hypothesized that this area would be relatively protected both a) if the gloves were lying on a surface or used for many ordinary tasks and b) if the glove was worn on a hand used to discharge a firearm. This area would serve as a negative control.

- Areas C and D: The back side (area C) and the palm side (area D) of the ring finger of the glove. These areas, not previously sampled in our 2015 analysis, would provide comparison samples to which the Area A samples would be compared.

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14. To conduct these analyses, we propose to use the following analytical approach:

- On each glove, excise a one-centimeter area from each of the four glove surfaces noted above (a total of eight samples).

- Particles (including GSR) would be isolated from each sample using the sonication method described in the July 21, 2015 Microtrace report.

- The collected particles would be analyzed using an automated GSR routine by SEM/EDS to determine the total number of GSR particles at each location.

- The results from each location would be summarized and compared to form conclusions.

15. If the gloves are released to Mr. Young's counsel and sent to my laboratory (Microtrace LLC, in Elgin, Illinois), we intend to utilize the testing method described above. I expect that the testing would take approximately three weeks from the time that funding is authorized and the gloves are received.

I, Christopher S. Palenik, Ph.D., declare under penalty of perjury under the laws of Texas and the laws of the United States of America that the foregoing is true and correct. Executed this 13th day of JAN, 2017, in Elgin, Illinois.

CSP

Christopher S. Palenik, Ph.D.

OFFICIAL SEAL
ADAM VIETMEIER
Notary Public - State of Illinois
My Commission Expires Apr 20, 2018

CSP
Initials

INDIVIDUAL ACKNOWLEDGMENT

State/Commonwealth of IL

County of Kane } ss.

On this the 13 day of January, 2017, before me,
Day Month Year

Christopher Peterik Adam Vietmeier, the undersigned Notary Public,
Name of Notary Public

personally appeared Christopher Peterik,
Name(s) of Signer(s)

☑ personally known to me – **OR** –

☐ proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same for the purposes therein stated.

OFFICIAL SEAL
ADAM VIETMEIER
Notary Public - State of Illinois
My Commission Expires Apr 20, 2018

WITNESS my hand and official seal.

Signature of Notary Public

Any Other Required Information
(Printed Name of Notary, Expiration Date, etc.)

Place Notary Seal/Stamp Above

OPTIONAL

This section is required for notarizations performed in Arizona but is optional in other states. Completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: ______

Document Date: ______ Number of Pages: ______

Signer(s) Other Than Named Above: ______

EXHIBIT A

Curriculum Vitae

of

Dr. Christopher Samuel Palenik

(cpalenik@microtracellc.com)

Current as of 1/5/2017

Microtrace
790 Fletcher Drive
Suite 106
Elgin, IL 60123-4755

847.742.9909 (p)
847.742.2160 (f)

www.microtracellc.com

Table of Contents

Educational History

2002-2004	University of Michigan, Department of Geological Sciences Ph.D. Geology Dissertation Chair: Prof. Rodney C. Ewing Dissertation Committee: Prof. Eric J. Essene, Prof. Ronald Fleming, Prof. Lumin Wang, Prof. Lynn Walter DOE-OCRWM fellowship recipient Horace H. Rackham 2004 Distinguished Dissertation Award
1999-2001	University of Michigan, Department of Geological Sciences M.S. Geology Prof. Rodney C. Ewing, Advisor
1995-1999	University of Chicago B.S. Chemistry, B.S. Geology
1992-1995	Illinois Mathematics and Science Academy, Aurora, IL
1991-1992	Saint Edward's Catholic Central High School, Elgin, IL

Employment

2005 - Present	Vice President and Senior Research Microscopist, Microtrace, a forensic laboratory specializing in small particle analysis using microchemistry and microscopy.
2004-2005	Federal Bureau of Investigation (ORISE sponsored) Post-Doctoral Fellow in the Counter Terrorism and Forensic Science Research Institute.
1999-2004	Graduate Student Research Assistant in the Electron Microbeam Analysis Laboratory, University of Michigan. Duties include training and assistance to university scientists in TEM, EMPA, XRD, and SEM/EDS.
1999-2000	Graduate Student Instructor for Determinative Methods (GS-455). Teaching responsibilities included XRD, SEM, Microprobe, Raman, FTIR.
1993-2004	Microscopist (consultant) at Microtrace, a forensic laboratory specializing in small particle analysis using microchemistry and microscopy.

Appointments and Committees

- Chemistry/Instrumental Analysis Scientific Area Committee's (SAC's) Materials (Trace) Subcommittee within the Organization of Scientific Area Committees (OSAC), appointed by Mark Stolorow of the National Institute of Standards (NIST) (2014-present)
- North Carolina Forensic Science Advisory Board Member, Charter Member, Appointed by the Attorney General of the State of North Carolina. Acting as an advisor to the NC State Crime Laboratory to strengthen the laboratory system. (2012-present)
- ASTM International, Subcommittees: E30 - Forensic Sciences, E30.01 – Criminalistics, E30.11 - Interdisciplinary Forensic Science Standards, Participating Member (2014-present)

- Scientific Working Group for the analysis of Geological Materials (SWGGEO), charter member (2012-2014).
- Independent Review Board for Lawrence Livermore National Laboratory "U and Pu Impurities" Project (2013)
- UNESCO International Union of Geological Sciences (IUGS) Initiative on Forensic Geology Geological (IoFG) Trace Evidence Advisor. (2011-present)
- FermiLab Community Advisory Board Member (2010)
- Board of Directors, RQA Food Forensics LLC (2008-present)
- Alumni Board Member, University of Michigan Department of Geological Sciences (2005-2015)

Professional Affiliations

- International Association of Geoanalysts (2016-present)
- American Society of Trace Evidence Examiners (ASTEE), Charter Member (2009-present)
- American Academy of Forensic Sciences, Fellow (2001-present)
- Midwestern Association of Forensic Scientists, Member (2007–present)
- Mineralogical Society of America (2000-present)
- Geological Society of America (2002-present)
- Sigma Xi – Scientific Research Society, Member (1998-2013)
- American Chemical Society (1998-present)
- State Microscopical Society of Illinois (1998-2000, 2007-2010)
- Materials Research Society (2002-2004)

Honors

- Certificate of Recognition by the Midwestern Association of Forensic Scientists for appointment to the Materials (Trace) OSAC Committee, Board of Directors (2015)
- Horace H. Rackham Distinguished Dissertation Award (Highest honor given to dissertations produced under the auspices of the University), University of Michigan (2004)

- John Dorr Graduate Academic Achievement Award – Department of Geological Sciences, University of Michigan (2004)
- Geological Society of America, Travel Grant, (2004)
- Graduate Fellowship Recipient, Department of Energy - Office of Civilian Radioactive Waste Management, (2002-2004)
- Best Paper Award, C.S. Palenik and R.C. Ewing, "Microanalysis of Radiation Damage Across a Zoned Zircon Crystal" - Materials Research Society National Meeting (2001)
- Geological Society of America Travel Grant (2004)
- Scott Turner Research Grant in the Earth Sciences (2001, 2002)
- Member, Rackham Graduate Student Forum (2002)
- Co-President, University of Michigan Geology Club (2000-2002)
- Dean's List, University of Chicago (1995-96, 1997-98, 1998-99)

Expert Testimony and Deposition

- List can be provided upon request.

Additional Training and Experience

- Fluorescence Microscopy. Lectures and Workshop taught by Dr. Steve Ruzin, Director, College of Natural Resources Biological Imaging Facility. 1.5 days of laboratory and lecture (2016).
- μ-XRF of glass: A practical explanation of ASTM E2926. Lectures by Troy Ernst, Michigan State Police Forensic Laboratory and Ted Manasian, Ohio Bureau of Criminal Investigation. Presented by NIJ / RTI (2016).
- Forensic Hair Analysis. Lecture by Dick Bisbing, retired from McCrone Associates and Michigan State Police. 3 days of laboratory and lecture (2015).
- Introduction to Basic Human Body Tissues. Taught by Dr. Lynne Herold, retired from the Los Angeles County Sheriff's Department Scientific Services Bureau. 2 day workshop (2015).
- Pistol Training. Taught by Jerry Kau, NRA-IPA-IA-ISV-IVA-Certified instructor (2015).
- Blood Spatter and trace Evidence in the Sam Shepard Case. Lecture and discussion presented by Bart Epstein (retired Assistant Director of from the Minnesota Bureau of Criminal Apprehension) (2014).
- Asbestos Analysis by TEM - Instruction in the Standard Methods for the Analysis of Asbestos. Taught by James R. Millette, Ph.D. and Steven P. Compton, Ph.D. of MVA Scientific Consultants, Duluth, GA. 3 day workshop (2014).

- Thermal Field Emission SEM Operations Training Course. Taught by Natasha Erdman, Ph.D. and Tony Laudate of JEOL at JEOL USA, Peabody, MA. 2 day workshop (2014).

- Forensic Applications of Infrared and Raman Spectroscopy. Taught by Ed Suzuki, Ph.D. of the Washington State Police Forensic Laboratory at Microtrace, Elgin, IL. 4 day workshop (2013).

- Post Mortem Root Banding Hair Workshop. Taught by Stephen Shaw, Sandy Koch, and Karen Korsberg Lowe of the Federal Bureau of Investigation and Amy Michaud (of the Bureau of Alcohol, Tobacco, Firearms, and Explosives) at the Smithsonian Institute. 1 day workshop (2013).

- Nanotechnologies in Textiles Workshop. Taught by Prof. Seshadri Ramkumar (of Technical Textiles in the Department of Environmental Toxicology, Texas Tech University). Webinar (2013).

- Automotive and Industrial Paint Workshop. Taught by Tim Moczulewski and Jon Granberg of PPG Industries at the Oak Creek, WI Coatings Plant in conjunction with the Midwestern Association of Forensic Scientists Annual Meeting. ½ day workshop (2012).

- The Analysis of Low Explosives. Taught by Edward C. Bender, ATF Laboratory, Retired. Held at Midwestern Association of Forensic Scientists Annual Meeting, Milwaukee, IL. 1 day workshop (2012).

- Optical Mineralogy. Taught by Prof. Mickey Gunter of the University of Idaho. 1.5 day workshop held at Microtrace LLC.

- ISO 17025 Without Tears. Taught by Terry Mills of ANSI-ASQ-FQS, Tampa, FL. Three day workshop (2012).

- Geology of Volcano National Park. Taught by Phillip Ong, M.S. at Volcano National Park, Big Island, HI. One day session (2012).

- Natural Fiber Identification. Taught by Skip Palenik at McCrone Research Institute. One day training session (2011).

- Animal Hair Identification. Taught by Bonnie Yates of the U.S. Fish and Wildlife National Forensic Lab at the National Institute of Justice Trace Evidence Symposium. One Day Workshop (2011).

- Quartz Grain Surface Textures. Taught by Prof. Peter Bull of Oxford University at Microtrace LLC. One Day Workshop (2011).

- Forensic Paint Examinations and Comparisons. Taught by Scott Ryland of the Florida Department of Law Enforcement (2010).

- An Introduction to Glass Science and Technology workshop. Taught by J. Terry Fisk of JTF Microscopy Services (formerly of the Corning Glassworks Research Lab, New York) (2010)

- Wood Identification workshop, taught by Dr. Regis Miller of the Center of Wood Anatomy Research, Forest Products Laboratory (2009)

- Microspectrophotometry User Course. Workshop taught by Dr. Jim Throne of CRAIC instruments at Microtrace (2009)

- Airborne Fungus Spores. Workshop taught by Dr. John Haines of the New York State Museum and Science Services, Albany, NY at McCrone Research Institute (2009)

- Energy Dispersive X-ray Spectroscopy- Thermo Noran System 6. Workshop taught by Dr. Dave West, ThermoFisher Scientific at Microtrace (2009)

- Private workshop on SERS sample preparation and analysis with Dr. Marco Leona of the New York Metropolitan Museum of Art (2008)

- Fluorescence Microscopy Workshop, taught by Dr. Steve Ruzin of the University of California at Berkeley at McCrone Research Institute (2008)

- Cement and Concrete Microscopy, taught by Don Campbell of the Campbell Petrographic Services, Inc. Dodgeville, Wisconsin (2007)

- Heavy Mineral Identification, taught by Maria Mange of the University of California at Davis (2007)

- Forensic Paint Examination, taught by Scott Ryland of the Florida Department of Law Enforcement, Lansing, MI (2007)

- Hardwood Identification workshop, taught by Dr. Regis Miller of the Center of Wood Anatomy Research, Forest Products Laboratory (2007)

- Advances and Changes in Forensic Paint Examination Workshopt, taught by Scott Ryland of the Florida Department of Law Enforcement at California Associate of Criminalists Semi-annual workshop (2006)

- Forensic Soil Examination Workshop, taught by Dr. Ray Murray, Dr. Robert Graham, Marianne Stam, Dr. Lynne Macdonald, Dr. George Sensabaugh, Skip Palenik and Chris Palenik, at California Associate of Criminalists Semi-annual workshop.

- Paper Fiber Identification Workshop, taught by Dr. Walter Rantanen of the Integrated Paper Service (2006)

- Wood Identification Workshop, taught by Dr. Walter Rantanen of the Integrated Paper Services (2006)

- Softwood Identification workshop, taught by Dr. Regis Miller of the Center of Wood Anatomy Research, Forest Products Laboratory (2006)

- Orientation Imaging Microscopy and Phase Identification EBSD workshop, taught by David Dingley and Matthew Nowell, TSL/EDAX, Draper, Utah, (2005)

- Forensic Analysis of Paint, taught by Ed Suzuki, Ed Bartick, FBI Academy, Quantico, VA (2004)

- FTIR Spectroscopy, taught by Edward Bartick, John Reffner, Edward Suzuki, FBI Academy, Quantico, VA (2004)

- Cathodoluminescence Microscopy Workshop, taught by V. Barbin, M. Schvoerer, K. Ramseyer, Florence, Italy (2004)

- Spent Nuclear Fuel workshop, Chicago, IL (2004)

- Lock and Security workshop, Folger-Adams Security, Lemont, IL (2004)

- Metal Working instruction workshop, taught by Julian Broad, Shop Supervisor, University of Michigan (2004)

- Scientific Glassblowing workshop, taught by Harald Eberhart, Master Glassblower, Ann Arbor, MI (2003)
- Secondary ionization mass spectroscopy (SIMS) of uraninite, under Prof. M. Fayek, Oak Ridge National Laboratory, TN (2003)
- Spindle Stage Methods workshop, Instructors: Prof. D. Bloss, Prof. M. Gunter, Dr. S. Su, McCrone Research Institute, Chicago, IL (July, 2003)
- Actinide Chemistry workshop, Institute for Transuranic Elements, Karlsruhe, Germany (June 2003)
- Micro-Raman spectroscopy research on radiation damage in zircon, under Prof. L. Nasdala, Universität Mainz, Germany (March 2002)
- Micro-XRF experimentation, Advanced Photon Source, Argonne, IL (2002)
- Engineering Mineralogy of Ceramic Materials workshop, University of Siena, Italy (June 2001)
- Forensic Fiber Examination, Instructor: S. Palenik, Department of Public Safety, Austin, TX (June, 2000)
- Synthesis of Hf-borosilicate glasses, under Prof. L.L. Davis, Pacific Northwest National Laboratory, Hanford, WA (February, 2000)
- Design and development of the "Microtrace Forensic Fiber Reference Collection", with S. Palenik, Microtrace, Elgin, IL (1998-1999)
- Study of automobile paint finish systems, under Dr. W. Stoecklein, Forensic Science Institute of the Bundeskriminalamt, Wiesbaden, Germany (Summer 1998)
- Study of inclusions in the Allende meteorite, Prof. L. Grossman and Dr. S. Simon, Department of Geophysical Sciences, University of Chicago (1996-1998)
- Mentorship study of Gel-based inks, under L. Olson, National Forensic Laboratory, Internal Revenue Service (1994-1995).
- Infrared Spectroscopy Interpretation, Bowdoin College, Maine, (June, 1996)
- Microchemical Methods, Instructor: S. Palenik, McCrone Research Institute, Chicago, IL (1996)
- Scanning Electron Microscopy, Instructor: Stevens, McCrone Research Institute, Chicago, IL (1994)
- NMR Spectroscopy use and interpretation, IMSA, Aurora, IL (1993-1995)
- Polarized Light Microscopy, Instructor: J. Delly, McCrone Research Institute, Chicago, IL (1992)

Analytical Techniques

Include but are not limited to: Polarized light microscopy, thermal microscopy, scanning electron microscopy, electron microprobe, energy dispersive X-ray spectroscopy, high-resolution transmission electron microscopy, Raman microspectroscopy, infrared microspectroscopy, cathodoluminescence, UV/visible spectroscopy, scanning white light interferometry, UV/visible/near infrared microspectrophotometry, powder x-ray diffraction, micro-X-ray fluorescence, phase contrast microscopy, differential interference contrast microscopy, fluorescence microscopy, gas chromatography-mass spectroscopy.

Research Grants

Nanotrace: Applications of subvisible to nanoscale particles in trace evidence (National Institute of Justice, 2015-DN-BX-K0033) – Role: Principal Investigator

Advanced research in Microspectrophotometry of Fibers: Analysis and Interpretation (National Institute of Justice, 2012-DN-BX-K040) – Role: Principal Investigator

Development of a Turnkey Analytical System for the Forensic Comparison and Identification of Fiber Dyes on Casework-sized Fibers (National Institute of Justice, 2012-DN-BX-K42) – Role: Principal Investigator

Raman spectroscopy of automotive and architectural pigments: in situ identification and evidentiary Significance (National Institute of Justice, 2011-DN-BX-K557) – Role: Principal Investigator

Fundamentals of Forensic Pigment Identification by Raman microspectroscopy: A practical identification guide and spectral library (National Institute of Justice, 2010-DN-BX-K236) – Role: Principal Investigator

GRADUATE COMMITTEES

Samuel Yatzkan (anticipated 2016) Detection and Persistence of Gunshot Residue (GSR) on Facial Features using SEM/EDX. Master of Science in Forensic and Investigative Science, West Virginia University. Additional committee members: Prof. Keith Morris (chair) and Prof. Susan Bell.

Barbara Fallon (2016) A Tale of two corchorus species: jute and its substitutes in commercial goods. Forensic Science – Master of Science, Michigan State University. Additional committee members: Prof. Ruth Smith (chair) and Prof. Jeremy Wilson.

Katelyn Hargrave (2013) A New Technique for the Identification of Dyes Extracted from Fibers. Master of Science in Forensic Science, University of Illinois at Chicago.

Publications and Teaching

Courses and Workshops Taught

Advanced Trace Evidence Analysis (2016). Topics included: dye and pigment identification, soil analysis, nanoparticle analysis – workshop taught by Palenik C. at the 8th Annual Asian Network of Forensic Sciences meeting, Bangkok, Thailand.

Petrographic identification of soil minerals (2015) - workshop taught by Palenik, S. and Palenik, C.S. at the National Institute of Justice Impression, Pattern and Trace Evidence Symposium (IPTES), San Antonio, TX.

Applications of Raman Spectroscopy for Trace Evidence Examinations (2014) – workshop taught by Buzzini, P, Suzuki, E.M., Palenik, C.S., Bowen, A.M. at the American Academy of Forensic Sciences Annual Meeting, Seattle, WA.

What did you just step in? (2011) – workshop taught with Mooney, K.E., Flohr, D.B., Bowen, A, Stoney, D, Bisbing, R., Hopen, T., Murray, R., Palenik, C.S., Palenik, S., Schneck, W.M., Stam, M. at the American Academy of Forensic Sciences Annual Meeting, Atlanta, GA.

Classification of Pigments by Raman Spectroscopy (2011) – workshop taught at the Midwestern Association of Forensic Sciences Ruby Jubilee Meeting, Lombard, IL.

Identification of Animal Hairs (2011) – workshop taught with Skip Palenik and Jason Beckert at the American Academy of Forensic Sciences Annual Meeting, Chicago, IL.

Advanced Hair and Fiber Microscopy – synthetic fiber section (2009) taught with Skip Palenik and Jason Beckert at McCrone Research Institute, Chicago, IL.

#Methods in Stereomicroscopy (2009) Customized Class. Rockville, MD.

#Forensic Pigment Analysis (2009) National Institute of Justice (NIJ) Trace Evidence Symposium, Clearwater Beach, FL.

Special topics in Forensic Science (2008) taught with Skip Palenik and Jason Beckert at McCrone Research Institute, Chicago, IL.

#Palenik, C.S (2005-2008) Trace evidence in forensic science. Seminar presented at Northwestern University Forensic Science Series, Chicago, IL (presented annually)

Introductory workshop to Forensic Microscopy (2007) taught with Skip Palenik at the Federal Bureau of Investigation (FBI) / National Institute of Justice (NIJ) Trace Evidence Symposium, Clearwater Beach, FL.

Book Chapters and Peer Reviewed Reports

Palenik, C.S. (2015) Forensic Microscopy in Forensic Chemistry (ed. Jay Seigl) American Academy of Forensic Sciences under Wiley Publications.

Palenik, C.S., Palenik, S., Groves, E., Herb, J. (2013) Raman spectroscopy of automotive and architectural paints: in situ pigment identification and evidentiary significance. Submitted in completion of NIJ grant 2011-DN-BX-K557.

Palenik, C.S., Palenik, S., Herb, J., and Groves, E. (2011) Fundamentals of Forensic Pigment Identification by Raman Microspectroscopy: A practical identification guide and spectral library for forensic science laboratories. Submitted in completion of NIJ grant 2010-DN-BX-K236.

Palenik, C.S. and Buscaglia, J. (2007) Applications of cathodoluminescence in Forensic Science, in Forensic analysis on the Cutting Edge: new methods for trace evidence analysis, ed. R. Blackledge, Wiley.

Palenik, C.S. (2004) Isotopic and Neutronic Composition of the Okelobondo Natural Nuclear Reactor. Ph.D. Thesis, University of Michigan.

Palenik, S.J. and Palenik, C.S. (2004) Microscopy and microchemistry of physical evidence, in Forensic Science Handbook II, 2nd ed. Ed. R. Saferstien, Prentice Hall.

Journal Articles

Carlton, R.A., Mistry, N., Yoest, L., Palenik, C.S., Buyuklimanli, T., (in preparation 2016) Characterization of Molded Vial Glass Corrosion (Delamination) with Flolan® Diluent (pH 12). PDA Journal of Pharmaceutical Science and Technology.

Groves, E.G., Palenik, S.J., and Palenik, C.S. (accepted 2016) A Survey of Extraction Solvents in the Forensic Analysis of Textile Dyes. Forensic Science International.

Groves, E.G. and Palenik, C.S. (accepted, 2014) Applications of Blue Light Curing Acrylic Resin to Forensic Sample Preparation and Microtomy. Journal of Forensic Science. March 2016, Vol. 61, No. 2 489-493.

Palenik, C.S. and Palenik, S. (2014) Seeing Color: Practical Methods in Pigment Microscopy. The Microscope, v62, 51-61.

Trejos, T., Koons, R., Becker, S., Berman, T., Buscaglia, J., Duecking, M., Eckert-Lumsdon, T., Ernst, T., Hanlon, C., Heydon, A., Mooney, K., Nelson, R., Olsson, K., Palenik, C., Pollock, E.C., Rudell, D., Ryland, S., Tarifa, T., Valadez, M., Weis, P., Almirall, J. (2013) Cross-validation and evaluation of the performance of methods for the elemental analysis of forensic glass by µ-XRF, ICP-MS, and LA-ICP-MS. Anal Bioanalytical Chemistry, 405: 5393-5409 (DOI 10.1007/s00216-013-6978-y).

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Palenik, C.S. and Diaczuk P. (2013) Plumbum microraptus: Microscopic indicators of a bullet hole in a synthetic fabric. The Microscope Journal and reprinted in the Journal of the American Society of Trace Evidence Examiners (Volume 4, Issue 2, August 2013).

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Conference Proceedings

Palenik, C.S., Jensen, K.A. and Ewing, R.C. (2004) The impact of uncertainties in geochemical modeling on performance assessments: Lessons from natural analogues. Materials Research Society Spring Meeting, San Francisco, CA.

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Other Publications

Palenik, C.S. and Jackson, G. (2016) Forensic Myths and Methods. The Analytical Scientist, March 2016 #38, 24-32.

Palenik, C.S., Palenik, S.J., and Groves, E.G. (2014) Forensic Microscopy, In: Reedijk, J. (Ed.) Elsevier Reference Module in Chemistry, Molecular Sciences and Chemical Engineering. Waltham, MA: Elsevier. 07-Aug-14 doi: 10.1016/B978-0-12-409547-2.11426-X.

Palenik, C. and Nytes, B. (2014) Mercury Wings, (ed.) Bethany Halford in Chemical and Engineering News, Newscripts. Volume 92 Issue 22, p40, June 2, 2014.

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Palenik, S.J. and Palenik, C.S. (1999) Forensic Fiber Identification Course Guide. Microtrace: Elgin, IL, 32p.

Abstracts and Talks

*Keynote or Plenary address; #Invited talk; ^Session chair

#Palenik, C.S. (2017) Scientific Foundations Session 1, National Commission on Forensic Science. National Institute of Justice, Washington, DC.

#Palenik, C.S. (2016) Counterfeit materials and their relation to forensic science. Interpol Forensic Science Managers Symposium, Lyon France.

#Palenik, C.S. (2016) The invaluable role of a technician in forensic science. Fall Annual Meeting of the Midland Section of the American Chemical Society, Midland Michigan.

*Palenik, C.S. (2016) Forensic microscopy and the lost art of observation. Fall Annual Meeting of the Midland Section of the American Chemical Society, Midland Michigan.

#Palenik, C.S. (2016) Advanced trace evidence analysis: from micro to nano. Asian Forensic Sciences Network Annual Meeting 2016, Bangkok, Thailand.

#Palenik, S.J. and Palenik, C.S. (2016) The Utilization of Microscopy in Developing Investigative Leads from the Examination of Microscopic Trace Evidence in Forensic Investigations. Microscopy and Microanalysis 2016 Meeting, Dayton, OH.

Hargrave, K.H., Nytes, B.N., Hopen, T., Palenik, C.S. (2016) Applications of Glass Microspheres as Forensic Trace Evidence. Presentation at Inter/Micro 2016, Chicago, IL.

Groves, E.G. and Palenik, C.S. (2016) A practical approach to forensic dye identification: method and validation. Presentation at Inter/Micro 2016, Chicago, IL.

Palenik, C.S., Groves, E.G., and Palenik, C.S. (2016) Dye Identification in Casework: How far can you go? Presentation at Inter/Micro 2016, Chicago, IL.

Scott, K.R., Palenik, C.S., Palenik, S., Morgan, R.M. (2016) A multidisciplinary approach to the collection and analysis of aquatic trace evidence from clothing exhibits. Australian and New Zealand Forensic Science Society International Symposium. Auckland, New Zealand.

Scott, K., Morgan, R., Palenik, C.S. and Palenik, S.J. (2015) Developing the techniques available for the collection and analysis of forensic evidence in freshwater crime scene environments. National Institute of Justice Impression, Pattern and Trace Evidence Symposium (IPTES), San Antonio, TX.

Fallon, B.L., Palenik, C.S. and Palenik, S.J. (2015) Jute and its Substitutes in Common Goods. National Institute of Justice Impression, Pattern and Trace Evidence Symposium (IPTES), San Antonio, TX.

Palenik, C.S. (2015) Decreasing the Scale and Increasing the Scope of Trace Evidence. National Institute of Justice Impression, Pattern and Trace Evidence Symposium (IPTES), San Antonio, TX.

^Palenik, C.S. (2015) Surrounded by Spheres: Microspheres and nanospheres in the world around us. Inter/Micro 2015. Chicago, IL.

Nytes, B.N., Palenik, C.S., Palenik, S.J. (2015) Microchemistry: Not such a small thing. Inter/Micro 2015. Chicago, IL.

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Fallon, B.L., Palenik, C.S., and Palenik, S. (2015) A Tale of Two Corchorus Species: Jute and Its Substitutes in Common Goods. Inter/Micro 2015. Chicago, IL.

^#Palenik, C.S. (2015) Keynote Address. Microscopy and the lost art of observation. SCIX 2015, Providence Rhode Island.

#Palenik, C.S. (2015) Microscopy: My Professional Hobby. State Microscopical Society of Illinois monthly speaker series. Chicago, IL.

Palenik, C.S. and Palenik, S.J. (2015) Microtrace to Nanotrace: Extracting information at increasingly smaller length scales. American Academy of Forensic Sciences Annual Meeting, Orlando, FL.

^,#Palenik, C.S. (2014) Identification and Significance of Colorants in Forensic Casework. World Forensic Festival (IAFS 2014, AFSN 2014, APMLA 2014), Seoul, Korea.

Palenik, C.S. and Palenik, S.J. (2014) Seeing Color: Practical Methods in Pigment Microscopy. Inter/Micro 2014, Chicago, IL.

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Groves, E. and Palenik, C.S. (2013) The use of blue light curing resins in forensic sample preparation, Inter/Micro 2013, Chicago, IL.

Palenik, C. and Beckert, J. (2013) Between the fringes: overlooked topics in microspectrophotometry, Inter/Micro 2013, Chicago, IL. (abstract accepted, talk not given due to illness)

Groves, E. and Palenik, C.S. (2013) Colorant basics: chemical organization of a dye and pigment database, Inter/Micro 2013, Chicago, IL.

Palenik, S. and Palenik, C.S. (2013) Development of a systematic approach to forensic dye identification, Inter/Micro 2013, Chicago, IL.

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#Palenik, C.S. and Palenik, S.J. (2013) Applications of Forensic Microanalytical Methods to the Identification and Sourcing of Particulate Matter in Pharmaceutical Products, Microscopy & Microanalysis 2013 sponsored by the Microscopy Society of America, Indianapolis, IN.

Palenik, C.S. (2013) Systematic in situ Identification of Pigments in Paint by Raman Microspectroscopy, AAFS, American Academy of Forensic Sciences National Meeting, Washington, DC.

Palenik, C.S. and Beckert, J.B. (2012) The Forensic Analysis of Paint Evidence Using Micro-Raman Spectroscopy, MAFS 2012, Milwaukee, WI.

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Sliwa, S., Groves, E., Palenik, M.C. (2012) Mapping Elemental and Refractive Index Variation in Container Glass, Inter/Micro 2012, Chicago, IL.

Herb, J., Palenik, C.S., and Palenik, S.J. (2012) Four Score and Seven Years Ago" or Was It? : Authenticating President Abraham Lincoln's Signature, Inter/Micro 2012, Chicago, IL.

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#Palenik, C. (2011) Forensic Soil Examination at the NIJ Sponsored Elemental Analysis Working Group Meeting Miami, Florida – October 12-13, 2011.

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Herb, J.N. and Palenik, C.S. (2011) Use of surface enhanced Raman spectroscopy (SERS) applied to the study of fluorescing pigments and dyes. American Academy of Forensic Sciences National Meeting, Chicago, IL.

Nytes, B.N, Beckert, J., Palenik, C.S., and Palenik, S. (2011) Obtaining investigative forensic information from the analysis of rodents in food products. American Academy of Forensic Sciences National Meeting, Chicago, IL.

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Buscaglia, J., Palenik, C.S., and Peaslee, G. (2009) Trace evidence applications of cathodoluminescence (CL) microspectrophotometry. Trace Evidence Symposium (National Institute of Justice (NIJ), Clearwater Beach, FL.

Wilke, B. and Palenik, C.S. (2009) Organic Pigments: Analytical characterization and classification by Raman spectroscopy. Inter/Micro 09, Chicago, IL.

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#Palenik, CS (2008) Food Forensics: Applications of microscopy and microchemistry to contamination issues in the food industry. Presented to the Griffth Laboratory Global Summit Meeting, Lombard, IL.

#Palenik, CS (2008) Big Picture Clues from Microscopic Particles: Applications of Geology to Forensic Science. Colgate University, NY.

Peaslee, GF, Buscaglia, J, Palenik, CS (2008) Cathodoluminescence as a Forensic Tool. 2008 Joint Meeting of The Geological Society of America, Soil Science Society of America, American Society of Agronomy, Crop Science Society of America, Gulf Coast Association of Geological Societies with the Gulf Coast Section of SEPM. Houston, TX.

Bales, H. and Palenik, CS (2008) Planar Section of Multilayer Paint Chips. Inter/Micro 2008, Chicago, IL.

Palenik, S. and Palenik, CS (2008) A Practical Technique for the Recognition of Modern Sculptures Proffered as Ancient Works of Art. Inter/Micro 2008, Chicago, IL.

Palenik, CS and Bonta, H. (2008) Microanalytical Characterization of Architectural Paint Pigments. Inter/Micro 2008, Chicago, IL.

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Palenik, CS and Nytes B (2007) The *in situ* identification of pigments in CMYK printing inks. Inter/Micro 2007, Chicago, IL.

Palenik, CS and Palenik, SJ (2007) Ensuring the Continued Role of Science in the Forensic Examination of Trace Evidence. Proceedings of the 2007 American Academy of Forensic Sciences National Meeting, San Antonio, TX.

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#Palenik, CS (2006) Trace Evidence for the Public Defender. Missouri State Public Defender Winter Workshop, St. Louis, MO.

#Palenik, CS (2006) Forensic Microscopy of Fibers. Presentation at Philadelphia University seminar series.

#Palenik, CS (2006) Cathodoluminescence in Forensic Science. Presentation Soil Analysis workshop at California Association of Criminalists Fall Seminar.

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Palenik, C.S. (2006) Novel applications of cathodluminescence microscopy. Inter/Micro-06, Chicago, IL.

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Palenik, C.S. (2006) From PhD to Professional: Bridging the Gap. 3rd Annual Northwestern University PLU Career Forum.

#Palenik, C.S. (2005) Applications of microscopy and microchemistry in forensic science. Talk given at Chemistry Dept. seminar, University of Wisconsin Platteville.

Egan, J.M., Mooney, K.E., Palenik, C.S., Rickenback, M.P., Golombeck, R.A. and Mueller, K.T. (2005) Synthesis, Isolation, and Characterization of Chlorinated Products of Bank Security Dye Packs Upon Bleaching, Pittcon - 2005, August, 2005.

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Jensen K.A., Palenik C.S., and Ewing R.C. (2003) Thermodynamic prediction of observed uranium minerals in the supergene-weathered Bangombé U-deposit: implications for blind prediction modeling. Uranium Geochemistry 2003, Nancy, France.

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EXHIBIT

13

<u>DECLARATION OF DAVID PAGE JR.</u>

I, David Page, declare as follows:

1. In 2001, I was arrested in Midland County, Texas for murder and aggravated kidnaping in connection with the shooting of Samuel Petrey. In 2003 I testified at Clinton Young's trial, which related to the same shooting. I knew Clinton as "Clint."

2. As I awaited trial on the charges against me, I was trying to reach a plea agreement with the Midland County District Attorney's Office.

3. I met numerous times, after my arrest, with Midland Count District Attorney Al Schorre, and Midland District Attorney Investigator J.D. Luckie. My attorney, Woody Leverett, was not always present at these meetings. Schorre and Luckie wanted me to testify against Clint. Both of them told me, "You help us, and we'll help you." They both used that phrase when talking to me. I understood them to mean that the more damaging my testimony was to Clint at his trial, the better plea offer I would receive on my own charges.

4. At first, the only actual plea offer I got from Schorre was sixty years if I pleaded guilty and testified against Clint. I rejected the sixty-year offer.

5. Soon thereafter, Schorre offered me a thirty-year sentence. I first heard about this offer before I was taken to San Angelo, Texas to take a polygraph exam. I was driven to the polygraph exam by J.D. Luckie.

6. I was never told that the thirty-year offer was contingent on how I did on the polygraph exam.

7. After I took the polygraph exam, the thirty-year offer remained on the table. Nobody ever told me the offer was no longer valid or available. Schorre and Luckie kept telling me it was important for me to testify against Young.

DLP
Initials

8. During our discussions about my upcoming testimony against Young, I told Schorre and Luckie, "Give me what I want and I'll give you want you want." The thirty-year offer was a verbal thing, and I thought that if they liked my testimony I would get a lot less than thirty years.

9. I figured that thirty years was the worst I would get as a sentence, and that if the District Attorney's Office liked what I said as a government witness they might offer me a shorter sentence.

10. During Clint's trial, during a recess in my testimony, Schorre came into the room where I was and said something like "You're doing good, keep it up."

11. At another recess during my testimony at Clint's trial, an investigator from the Harrison County District Attorney's Office told me something like, "You're doing good. This could possibly help you with your sentence."

12. Months after I testified at Young's trial, Luckie picked me up at the Midland County Jail. It was not unusual for Luckie to do this. He had done so multiple times so that we could talk about the case.

13. This time, Luckie told me that Schorre wanted me to agree to a plea. I said, "How much time am I going to get?" Luckie told me it was the same 30 years that had been on the table since before Young's trial.

14. I was shocked and upset. I told Luckie, "I did what you asked me to do. So why aren't you helping me?" I was hoping that my testimony would get me no more than 15 years in prison. I asked Luckie what happened and he didn't say anything. He just gave me a blank stare.

DLP
Initials

15. In December 2003, I finally accepted a plea deal for thirty years, for aggravated kidnaping.

16. I want to clarify a couple of things. First, Clint never mentioned going to see his girlfriend, Amber Lynch, before the shooting of Doyle Douglas. The first time he mentioned going to Midland to see Amber was after Douglas had already been shot.

17. Clint also never said that he wanted to slit the throat of Samuel Petrey, or that we should do that.

18. While Clint and I were in Doyle Douglas's car, driving from Harrison County towards Eastland after Douglas was shot, there were no shell casings on the front passenger seat or on the floor of the car. I was sitting in the front passenger seat, and did not see any casings there or feel them on the seat, nor did I see them on the car floor.

19. I understand that two shell casings were found in the front passenger seat area of Douglas's car. Those shell casings may have been put into the car when Clint shot at the inside of the car in Eastland, when we abandoned it.

20. At trial, I testified about a pair of gloves that belonged to me, and that I had with me when Douglas and Petrey were killed. I bought those gloves from a convenience store, the night Douglas was shot.

21. I testified at Clint's trial that at one point Clint, Petrey, and I went to a Wal-Mart store and Clint asked Petrey to buy him some clothes. Clint did not actually ask Petrey to buy him the clothes. What actually happened was that Clint was planning to put on the new clothes at the Wal-Mart and walk out the door wearing them, and Petrey offered to pay for them to avoid us being stopped or arrested by law enforcement. Clint told Petrey there was no need for him to pay, but he finally accepted Petrey's offer.

DLP
Initials

22. Before Clint's trial, J.D. Luckie told me several times that he thought I was the one who shot Samuel Petrey.

23. When I testified at Clint's trial, I believed that if my testimony made Clint look worse, I would get a better deal from the state on my own case. To increase my chances of getting a good plea deal, I tried to make Clint look as bad as possible.

I declare under penalty of perjury under the laws of the United States of America and of the State of Texas that the foregoing is true and correct.

DATED: 8-20-2015

David L Page Jr
DAVID PAGE JR.

GAYE KARRIKER
NOTARY PUBLIC STATE OF TEXAS
MY COMMISSION EXPIRES
07/20/2019

NOTARY PUBLIC STATE OF TEXAS

Gaye Karriker

DLP
Initials

EXHIBIT

14

8.1 GUNSHOT PRIMER RESIDUE ANALYSIS

1 Scope

Hand swabs submitted for gunshot primer residue (GSR) analysis are processed and analyzed by Inductively Coupled Plasma–Atomic Emission Spectroscopy (ICP–AES). This procedure permits the identification and quantitation of Barium, Lead and Antimony, upon which the basis for a conclusion to the presence of GSR is made. The presence of significantly elevated levels of antimony, barium and lead are highly indicative of, but not specific to, primer gunshot residue

2 Safety

Standard laboratory precautions
Exhaust from the ICP must be vented
Compressed gases

3 Forms

None

4 Equipment / Materials / Reagents

- Inductively Coupled Plasma–Atomic Emission Spectrometer
- Autosampler
- Oven
- Centrifuge
- Vortex
- Micropipettes (10-100 ul, 100-1000 ul, 500-2500 ul)
- Polypropylene sample tubes, 5 ml, with snap caps
- Polystyrene sample tubes, 10 ml, with screw caps
- Liquid argon
- Liquid nitrogen
- Compressed air
- **GSR Scandium** solution
- **Calibration Standard** solutions (**S0, S1, S2, S3, S4, QC1)**

5 Standards / Controls / Calibration

- A series of the **Calibration Standard** solutions **S0, S1, S2, S3** and **S4** are analyzed each day the instrument is used to calibrate the instrument response versus analyte concentration.
  S0 will contain 0.00 ug Ba, 0.00 ug Pb and 0.00 ug Sb
  S1 will contain 0.25 ug Ba, 0.25 ug Pb and 0.05 ug Sb
  S2 will contain 0.50 ug Ba, 0.50 ug Pb and 0.10 ug Sb
  S3 will contain 1.00 ug Ba, 1.00 ug Pb and 0.20 ug Sb
  S4 will contain 2.50 ug Ba, 2.50 ug Pb and 0.50 ug Sb
- Each run must include a quality control sample (QC1) that has been spiked to contain 0.050 ug Antimony, 0.250 ug Barium and 0.500 ug Lead. The measured concentration of the Antimony on this QC1 swab must be within the range of 0.050 ug +/- 10% in order to "pass". If the value is not acceptable, perform re-calibration to correct the problem. If re-calibration fails to produce an acceptable result, advise the supervisor. Consultation with a service engineer may be needed. Casework cannot proceed until the quality control sample "passes".

- The results of the QC1 swab will be documented in the case file and in the instrument log.

6 Procedure

6.1 Sample Preparation

1. Examine the swab for dirt, gunpowder particles, blood, foreign fibers or other material and record your findings. Moist swabs must be dried by placing the uncapped tubes in an 80° C oven overnight. When dry, remove the tubes and allow to them to cool.
2. Cut the tips from the swabs of each sample and place them into pre-labeled 5 ml sample tubes.
3. Add 2.00 mL of the **GSR Scandium** solution to each sample tube. Tightly cap each tube and vortex for approximately 30 seconds.
4. Loosen caps of all tubes slightly and return the tubes to 80° C oven for 2 hours.
5. Remove the tubes, reseal the caps and vortex for 30 seconds or until the cotton is completely dispersed. Allow the samples to cool to room temperature.
6. Centrifuge all tubes to pack the loose cotton into the bottom of tubes.

6.2 Standards Preparation

1. Label sample tubes as S0, S1, S2, S3, S4 and QC1.
2. Cut the tips from new applicator swabs and place two tips into each tube.
3. Add 2 ml of the respective **Standard** solutions to each tube.
4. Tightly cap each tube and vortex for approximately 30 seconds.
5. Loosen the caps of all tubes and place the tubes in a 80° C oven for 2 hours.
6. Remove the tubes, reseal the caps and vortex for 30 seconds or until the cotton is completely dispersed. Allow the samples to cool to room temperature.
7. Centrifuge all tubes to pack the loose cotton into the bottom of tubes.

6.3 Analysis

1. Pipet approximately 1ml of the sample and standard extracts into their respective pre-labeled 10 ml tubes.
2. Load the tubes onto the auto-sampler.
3. Start the analysis, using the method "GSR-JAR 5-23-00 PFA-ST". Instrumental parameters are listed in Appendix A.
4. Results of the case samples and the QC1 swab are printed for each case.

7 Interpretation

- A positive result for any hand swab must have significantly elevated levels of all three elements. The threshold levels are 0.050 ug Sb, 0.250 ug Ba and 0.500 ug Pb.
- A negative result for any hand swab must not have significantly elevated levels of more than one of the elements
- An inconclusive result for any hand swab must meet at least one of the following criteria:
  1. The swab must have significantly elevated levels of two of the elements, but not all three, or;
  2. The analysis of the control swab reveals significant contamination and the results are positive, or;
  3. The time frame between the shooting and sampling exceeds four (4) hours for a living subject.

Literature / Supporting Documentation

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2. Koons, R.D., Havekost, D.G., and Peters, C.A., "Analysis of Gunshot Primer Residue Collection Swabs Using Flameless Atomic Absorption Spectrophotometry: A Reexamination of Extraction and Instrument Procedures", Journal of Forensic Sciences, Vol. 32, No. 4, July 1987, pp. 846-865.
3. Aaron, R.W., "Gunshot Primer Residue: The Invisible Clue", FBI Law Enforcement Bulletin, June 1991, pp. 19-22.

APPENDIX A
Parameters and Configurations of the Perkin-Elmer
Optima 3000 SC ICP-AES

Plasma Parameters
- Torch Configuration: Axial
- Plasma: 15L/min
- Auxiliary: 0.5 L/min
- PFA-ST Micro-flow nebulizer, PFA-ST Self Aspiration: 0.80 L/min
- Power Watts: 1360
- View Hgt: 15
- PFA Spray Chamber or equivalent
- PFA Endcap or equivalent

Symbol, Wavelength, Name, and Function:

Symbol	Wavelength	Name	Function
Sb	206.833	Sb 206.833	Analyte
Ba	233.527	Ba 233.527	Analyte
Pb	220.353	Pb 220.353	Analyte
Sc	361.384	Sc 361.384	Analyte

Spectrometer, Read Time, Replicates
- Spectral Profiling: No
- Purge Gas Flow: Normal
- Read Time Auto: Min Time: 10.000 sec Max Time: 20.000sec
- Resolution: Normal
- Replicates: 3

Pump Parameters
- Pump tubing: orange/red (0.19mm i.d.)
- Sample Flow Rate: 1.1 mL/min
- Sample Flush Time: 0 sec.
- Sample Flush Rate: 4.0 mL/min
- Read Delay Time: 120 sec.

Model AS-90 Autosampler and Wash Parameters
- Capillary sample probe
- Tray Configuration: Tray B
- Wash Frequency: Between Samples
- Wash Location: 0
- Wash Rate: 1.2 ml/min
- Wash Time: 150 sec.

Peak Algorithms and Point /Peak

Cat	Analyte	Peak Algorithm	Pts/peak
A	Sb 206.833	Area	3
A	Ba 233.527	Area	3
A	Pb 220.353	Area	3
A	Sc 361.384	Area	3

Spectral Overlap and Background Correction

Cat	Analyte	Overlap Corr.	Backgrd Corr.	BGC1	BGC2
A	Sb 206.833	None	2-Point	-0.019	0.019
A	Ba 233.527	None	2-Point	-0.021	0.021
A	Pb 220.353	None	2-Point	-0.019	0.016
A	Sc 361.384	None	2-Point	-0.025	0.030

Calibration and Reagent Blank Usage

Cat	Element	Use	Calib blank Action	Subtract Reagent
A	Sb 206.833	Calib Blank 1	Subtract&Calib	n/a
A	Ba 233.527	Calib Blank 1	Subtract&Calib	n/a
A	Pb 220.353	Calib Blank 1	Subtract&Calib	n/a
A	Sc 361.384	Calib Blank 1	Subtract&Calib	n/a

Calibration Equation and Sample Units

Cat	Element	Calib. Equation	Units	Dec. Places	Sign. Fig.
A	Sb 206.833	Linear	ppm	3	4
A	Ba 233.527	Linear	ppm	3	4
A	Pb 220.353	Linear	ppm	3	4
A	Sc 361.384	Linear	ppm	3	3

Gases

Argon (70-120 psig)
Nitrogen (29-120 psig)
Compress Air from laboratory supply (60 psig)

8.2 GSR NITRIC ACID SOLUTIONS

5% Nitric Acid solution and 10% Nitric Acid solution are used to make dilutions of standards for Gunshot Primer Residue Analysis.

1 Specification

5% Nitric Acid solution
10% Nitric Acid solution

2 Safety

Wear disposable gloves and eye protection during preparation
Always add concentrated acid to water when mixing solutions

3 Special Equipment and supplies

- Polypropylene volumetric flasks, 1000 ml
- Glass pipets: 50 ml, 100 ml

4 Reagents

- Concentrated Nitric Acid, trace metal grade
- Deionized water

5 Instructions

A. 5% Nitric Acid solution
1. Pipet 50 ml of Nitric Acid into a 1000 ml polypropylene volumetric flask containing approximately 900 ml deionized water
2. Dilute to volume using deionized water

B. 10% Nitric Acid solution
1. Pipet 100 ml of Nitric Acid into a 1000 ml polypropylene volumetric flask containing approximately 800 ml deionized water
2. Dilute to volume using deionized water

6 Testing, Storage, expiration, and disposal

Minimum labeling includes specification above, initials, and date prepared.

Store at room temperature in a tightly capped flask. Shelf life is approximately six months.

8.3 GSR SCANDIUM SOLUTION

The Scandium solution is used to make dilutions of samples for Gunshot Primer Residue analysis.

1 Specification

GSR Scandium solution

2 Safety

- Wear disposable gloves and eye protection during preparation
- Always add concentrated acid to water when mixing solutions

3 Special Equipment and supplies

- Polypropylene volumetric flasks, 1000 ml
- Glass pipets: 50 ml, 100 ml
- Micropipet and tips to deliver 1.0 ml

4 Reagents

- Concentrated Nitric Acid, trace metal grade
- Scandium plasma emission standard (1000 ug Sc/ml)
- Deionized water

5 Instructions

1. Pipet 100.0 ml of Nitric Acid into a 1000 ml polypropylene volumetric flask containing approximately 800 ml deionized water.
2. Pipet 1.0 ml of 1000 ug Sc/ml standard into the same volumetric flask.
3. Dilute to volume using deionized water

6 Testing, Storage, expiration, and disposal

Minimum labeling includes specification above, initials, and date prepared.

Store at room temperature in a tightly capped flask. Shelf-life is approximately six months.

8.4 GSR SOLUTIONS

GSR solutions are used in the preparation of standards for Gunshot Primer Residue analysis.

1 Specification

GSR solution A
GSR solution B

2 Safety

Wear disposable gloves and eye protection during preparation

3 Special Equipment and supplies

- Polypropylene volumetric flasks: 100 ml, 500 ml
- Glass pipets: 10 ml, 25 ml

4 Reagents

- **5% Nitric Acid solution**
- Barium plasma emission standard (1000 ug Ba/ml)
- Lead plasma emission standard (1000 ug Pb/ml)
- Antimony plasma emission standard (1000 ug Sb/ml)
- Scandium plasma emission standard (1000 ug Sc/ml)

5 Instructions

1. Pipet the indicated amount of the plasma emission standards into separate marked 500 ml volumetric flasks:

Plasma Emission Standard	GSR Solution A	GSR Solution B
Ba	2.5 ml	2.5 ml
Pb	2.5 ml	5.0 ml
Sb	0.5 ml	0.5 ml
Sc	0.5 ml	0.5 ml

2. Dilute to volume with **5% Nitric Acid solution**

6 Testing, Storage, expiration, and disposal

Minimum labeling includes the appropriate specification above, initials, and date prepared.

Store at room temperature in tightly capped flasks. Prepare as needed or every six months.

8.5 GSR STANDARDS PREPARATION

Calibration standards are used for calibration and quality control of the Inductively Coupled Plasma-Atomic Emission Spectrometer for Gunshot Primer Residue analysis.

1 Specification

S0 solution; S1 solution; S2 solution; S3 solution; S4 solution; QC1 solution

2 Safety

Wear disposable gloves and eye protection during preparation.

3 Special Equipment and supplies

- Polypropylene volumetric flasks, 20 ml
- Glass pipets: 50 ml, 100 ml

4 Reagents

- **GSR Scandium** solution
- **10% Nitric Acid** solution
- **GSR Solution A**
- **GSR Solution B**

5 Instructions

1. S0 is the **10% Nitric Acid** solution.
2. Pipet the indicated amount of **GSR Scandium** solution and the appropriate **GSR** solution into a 20 ml volumetric flask.

	GSR Scandium solution	**GSR Solution A**	**GSR Solution B**
S1	19.5 ml	0.5 ml	-
S2	19.0 ml	1.0 ml	-
S3	18.0 ml	2.0 ml	-
S4	15.0 ml	5.0 ml	-
QC1	19.5 ml	-	0.5 ml

Final Concentrations (μg/ml) of samples should be:

	Ba	Pb	Sb
S0	0	0	0
S1	0.125	0.125	0.025
S2	0.25	0.25	0.05
S3	0.5	0.5	0.1
S4	1.25	1.25	0.25
QC1	0.125	0.25	0.025

6 Testing, Storage, expiration, and disposal

Minimum labeling includes specification above, initials, and date prepared.

Store at room temperature in tightly capped flasks. Shelf life is approximately six months.

SCANNING ELECTRON MICROSCOPY-ENERGY DISPERSIVE SPECTROMETRY (SEM-EDS)

1 Scope

Scanning Electron Microscopy-Energy Dispersive Spectrometry (SEM-EDS) can be used to obtain magnified images of samples and to obtain elemental information based upon the energy of the X-rays emitted by the sample when bombarded by electrons. The SEM serves a dual role of providing the energy to generate X-rays and isolating small regions for analysis. The EDS collects and processes the X-rays for chemical element identification.

Gunshot residue (GSR) particles can be detected and uniquely identified, based on morphology and elemental composition, using an automated SEM-EDS analysis. Gunshot residue particles detected during the automated analysis must be confirmed by the examiner.

2 Safety

Protective eyewear must be worn while filling the detector with liquid nitrogen

Radiation surveys are conducted by the Texas Dept. of Health, Bureau of Radiation Control. The radiation safety officer will retain these survey results.

3 Related Documents

None

4 Equipment / Materials / Reagents

- Scanning Electron Microscope-Energy Dispersive Spectrometer
- Elemental standard(s): Copper, Manganese, Rhodium
- Image standard
- Gunshot residue standard

5 Standards / Controls / Calibration

A. Each day the instrument is used for qualitative analysis, the Copper Kα peak (at 8.04 KeV) of a known Copper standard is used to calibrate the spectrometer. The analytical configuration must be set at 1024 channels, 20 KeV range, 15 mm working distance, processor speed at 5 or 6. At least 150,000 counts must be collected. The operator is prompted to perform a calibration every two hours. This prompt is suggested for best qualitative analysis. Analysis cannot begin unless the spectrometer is successfully calibrated.

B. The standard Copper spectrum will be placed in the case file. The instrument log will be marked.

C. Analysis of gunshot residue sample stubs requires a binary Molybdenum/Rhodium standard, an image standard and a gunshot residue standard.

6 Procedure

6.1 Sample Preparation

1. The Dewar is checked to ascertain sufficient liquid Nitrogen is present.
2. Samples are mounted onto sample stubs using conductive adhesive. A drawing of the surface of the stub assists in locating the samples in the SEM.
3. The sample stubs are placed into the chamber and the SEM-EDS is activated.

6.2 Sample Analysis

1. Calibrate the EDS with the Copper standard. Plot the results and mark the spectrum with case number, initials and date.
2. Focus on an area of the sample from which to collect X-rays while maintaining the 15 mm working distance.
3. Activate the X-ray collection system. Adjust the spot size and preset live time to obtain at least 150,000 counts.
4. Examine the spectrum for peaks with characteristic energies, label the peaks and plot the results.
5. Mark the spectrum with case number, initials, date and sufficient information to identify the particular sample.

7 Interpretation

A. An element is identified when:

1. A peak is statistically significant, and
2. The peak(s) has the characteristic energy for that element.

B. Elements present below about 0.1% may not be detectable.

C. Only peaks which are statistically significant should be considered for identification. The minimum size of the peak P should be three times the standard deviation of the background at the peak position, i.e., $P > 3(N_B)^{1/2}$. This peak height can be estimated directly on the EDS display from the statistical scatter in the background on either side of the peak. The "thickness" of the background trace due to statistical fluctuations in the counts is a measure of $(N_B)^{1/2}$. The peak, then, should be at least three time this thickness. If it is difficult because of statistical fluctuations in the count to decide whether a peak exists above the continuum, then more counts should be accumulated in the spectrum to "develop" the peak.

8 Literature / Supporting Documentation

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Heinrich, Kurt, Electron Beam X-Ray Microanalysis, Van Nostrand Reinhold, 1981.

Friel, John. 1995. X-Ray and Image Analysis in Electron Microscopy, Princeton Gamma-Tech, Inc.

Preparer

Steve Robertson Date: 05/14/2003
Trace Advisory Board Chair

Concurrence

Forrest W. Davis Date: 05/14/2003
Quality Assurance

Version #	Effective Date	Brief Description of Change(s)
00	07/01/2003	Original Issue

CERTIFICATE OF SERVICE

I hereby certify that on April 27, 2017, I served by United States Mail, a true and correct copy of the foregoing motion titled Defendant's Motion for an Order Authorizing Release of Physical Evidence to Defendant's Counsel or Counsel's Designated Representative for Purposes of Having the Evidence Independently Examined on counsel for Plaintiff at the following address:

Ralph Petty
Assistant District Attorney
500 N. Loraine Street, Floor 2
Midland, Texas 79701-4745

Dated: April 27, 2017

Margaret A. Farrand