



## Firearms Examination Test No. 17-527 Summary Report

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Each sample set consisted of three known expended bullets (Item 1) test-fired from a suspect weapon and four questioned expended bullets (Items 2-5). Participants were requested to examine these items and report their findings. Data were returned from 280 participants and are compiled into the following tables

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

## **Manufacturer's Information**

Each sample set contained five items: Item 1 consisted of three bullets fired in the suspect's firearm. Items 2, 3 and 5 (recovered from the scene) and Item 4 (recovered from the victim) each consisted of one bullet. PMC® Bronze 50 9mm Luger 115 grain full metal jacket (FMJ) Centerfire ammunition was used for Items 2, 3 and 5. Federal® Hydra-Shok® 9mm Luger 124 grain ammunition was used for Item 4. Participants were requested to determine which, if any, of the recovered questioned bullets (Items 2-5) were fired from the same firearm as the known bullets (Item 1).

The bullets in Items 1, 3, and 5 were fired in a Ruger Model SR9C 9mm handgun (Serial number 333-52813). Items 2 and 4 were fired in a Ruger Model SR9 9mm handgun (Serial number 330-36857).

ITEMS 1, 3, and 5 (IDENTIFICATION): Multiple magazines were loaded with PMC® ammunition for firing with the Ruger SR9C 9mm handgun. After the ammunition was expended, the bullets were collected and packaged together as a batch. This process was repeated until the required number was produced. Out of each batch, the necessary number of bullets were selected and inscribed with a "1" (three bullets), "3" (one bullet) or "5" (one bullet), then sealed into their respective jewel boxes and kept together as an association batch.

ITEM 2 (ELIMINATION): Multiple magazines were loaded with PMC® ammunition for firing with the Ruger SR9 9mm handgun. After the ammunition was expended, the bullets were collected. This process was repeated until the required number was produced. The necessary number of bullets were selected and inscribed with a "2" (one bullet), then sealed into their respective jewel boxes.

ITEM 4 (ELIMINATION): Multiple magazines were loaded with Federal® Hydra-Shok® ammunition for firing with the Ruger SR9 9mm handgun. After the ammunition was expended, the bullets were collected. This process was repeated until the required number was produced. The necessary number of bullets were selected and inscribed with a "4" (one bullet), then sealed into their respective jewel boxes.

SAMPLE SET ASSEMBLY: For each sample set, Item 1, along with Items 3 and 5 of the same association batch and elimination Items 2 and 4 were placed in a sample pack box. This process was repeated until all of the sample sets were prepared. Once verification was completed, the sample packs were sealed with evidence tape and initialed "CTS."

VERIFICATION: During test production, 10% of the bullets from each association batch were selected and intercompared to confirm that markings were consistent. Two predistribution laboratories reported the expected responses and one laboratory reported "inconclusive" for Items 2 and 4 and further stated that they could not be eliminated (similar class characteristics) or identified (lack of agreement of individual characteristics) to the Item 1 bullets.

## **Summary Comments**

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This test was designed to allow participants to assess their proficiency in a comparison of expended bullets. Participants were provided with three questioned expended PMC® Bronze 50 9mm Luger 115 grain full metal jacket (FMJ) Centerfire bullets (Items 2, 3 and 5) and one questioned expended Federal® Hydra-Shok® 9mm bullet which they were requested to compare with three known expended bullets (Item 1) that were fired in the suspect's weapon, a Ruger SR9C 9mm handgun. For each sample set, the Item 3 and Item 5 bullets were fired in the same firearm as the Item 1 known bullets. The Item 2 and Item 4 bullets were fired in a different firearm from that which discharged the Item 1, 3 and 5 bullets. [Refer to Manufacturer's Information for preparation details.]

In Table 1 Response Summary, 277 of 280 (99%) responding participants identified Items 3 and 5 and either eliminated or were inconclusive for Items 2 and 4 as having been fired from the same firearm as the Item 1 test-fired bullets. 2 participants identified Items 2, 3, 4 and 5 as having been fired from the same firearm as the Item 1 test-fired bullets. The remaining participant identified Item 5, eliminated Items 2 and 4 and was inconclusive for Item 3 as having been fired from the same firearm as the Item 1 test-fired bullets.

Many participants commented that two guns were involved and that Items 2 and 4 were fired from the same, unknown gun.

CTS is aware that many labs will not, as a matter of policy, eliminate without access to the firearm or when class characteristics match.

This was the first time that CTS used multiple ammunition types in a firearms examination proficiency test. The Federal® Hydra-Shok® (Item 4) bullet was included in the test set to provide participants with an item that closely resembles casework involving not only multiple ammunition types, but also a jacketed hollow point bullet that expands, causing "mushrooming".

# Examination Results

*Were any of the recovered questioned bullets (Items 2-5) fired in the same firearm as the known bullets (Item 1)?*

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
23HHTJ	No	Yes	No	Yes	7G9YRR	Inc	Yes	Inc	Yes
23ZEEQ	No	Yes	No	Yes	7HXAK7	No	Yes	No	Yes
298VWR	No	Yes	No	Yes	7MDKWN	No	Yes	No	Yes
2F7PNY	No	Yes	No	Yes	7NNH8K	No	Yes	No	Yes
2HWJTF	Inc	Yes	Inc	Yes	7RPL2T	Inc	Yes	Inc	Yes
2JPECH	No	Yes	No	Yes	7UEWU7	No	Yes	No	Yes
2N4CJ6	No	Yes	No	Yes	7VN3C2	Inc	Yes	Inc	Yes
2Q9Z2F	No	Yes	No	Yes	7XCFW6	No	Yes	No	Yes
2V4GP3	No	Yes	No	Yes	7XUMY2	No	Yes	No	Yes
2VME8U	Inc	Yes	Inc	Yes	82679U	No	Yes	No	Yes
333GQG	No	Yes	No	Yes	83JJ2X	No	Yes	No	Yes
3C6WDZ	No	Yes	No	Yes	84FWNQ	Inc	Yes	Inc	Yes
3GYT3R	No	Yes	No	Yes	8669G4	No	Yes	Inc	Yes
3KZ23V	No	Yes	No	Yes	899YQ6	No	Yes	No	Yes
3UNRR9	No	Yes	No	Yes	8C98YL	No	Yes	No	Yes
3VEX4T	No	Yes	No	Yes	8DH4FJ	No	Yes	No	Yes
3YZHD4	No	Yes	No	Yes	8DKPCY	No	Yes	No	Yes
49W86N	No	Yes	No	Yes	8DNEFW	No	Yes	No	Yes
4CHV2H	Inc	Yes	Inc	Yes	8ET2RF	Inc	Yes	Inc	Yes
4HQBDR	No	Yes	No	Yes	8JM3PM	No	Yes	No	Yes
4KEPZG	No	Yes	No	Yes	8N62PW	No	Yes	No	Yes
4YX4LN	No	Yes	No	Yes	8NYQPJ	No	Yes	No	Yes
68LK9V	No	Yes	No	Yes	8U7GRP	No	Yes	No	Yes
6B3TTN	No	Yes	No	Yes	8U93N7	No	Yes	No	Yes
6CUYWL	No	Yes	No	Yes	8ZAF8L	Inc	Yes	Inc	Yes
6E4TV7	Inc	Yes	Inc	Yes	96G9VP	No	Yes	No	Yes
6JV43J	Inc	Yes	Inc	Yes	96JUQ7	Inc	Yes	Inc	Yes
6XU86P	No	Yes	No	Yes	987FFM	No	Yes	No	Yes
6XYDXK	No	Yes	No	Yes	9GXV6Q	No	Yes	No	Yes
7BE7D4	No	Yes	No	Yes	9GZGZ7	Inc	Yes	Inc	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
9J72QR	No	Yes	No	Yes	CFDCU4	No	Yes	No	Yes
9NY7JW	Inc	Yes	Inc	Yes	CLGH8L	No	Yes	No	Yes
9PTVJJ	No	Yes	No	Yes	CP4TRK	No	Yes	No	Yes
9U3A8A	Inc	Yes	Inc	Yes	CPEYJF	No	Yes	No	Yes
9VTH9X	No	Yes	No	Yes	CRPUAD	No	Yes	No	Yes
9ZD3KT	Inc	Yes	Inc	Yes	CZECZF	No	Yes	No	Yes
9ZVCDU	Inc	Yes	Inc	Yes	D9CENC	No	Yes	No	Yes
A48CC8	No	Yes	No	Yes	DM679D	No	Yes	No	Yes
A4MZ77	No	Yes	No	Yes	DMALLE	Inc	Yes	Inc	Yes
A6K7R8	Inc	Yes	Inc	Yes	DQ83WM	No	Yes	No	Yes
A79PMD	No	Yes	No	Yes	DRJTYC	No	Yes	No	Yes
ABM84U	No	Yes	No	Yes	E2LGCU	No	Yes	No	Yes
AF6DTG	No	Yes	No	Yes	E2NBVZ	No	Yes	No	Yes
AGVLU7	No	Yes	No	Yes	E3DK2V	No	Yes	No	Yes
AH7MEJ	No	Yes	No	Yes	EA269H	No	Yes	No	Yes
AHZDFR	No	Yes	No	Yes	EC7TQT	No	Yes	No	Yes
AQEZQG	No	Yes	No	Yes	EEU8BW	No	Yes	No	Yes
AQX43M	No	Yes	No	Yes	EPBRWD	No	Yes	No	Yes
B3AJUT	No	Yes	No	Yes	ETQJM7	No	Yes	No	Yes
BMDHRR	No	Yes	No	Yes	EVZBWM	Inc	Yes	Inc	Yes
BN7AYR	No	Yes	No	Yes	FDVNJE	No	Yes	No	Yes
BNCJXJ	No	Yes	No	Yes	FENC6V	Inc	Yes	Inc	Yes
BNDA7M	No	Yes	No	Yes	FKELEU	No	Yes	No	Yes
BQCPCP	No	Yes	No	Yes	G7P3FH	No	Yes	No	Yes
BUDQGT	No	Yes	No	Yes	GFFQBK	No	Yes	No	Yes
BVTYLM	No	Yes	No	Yes	GMF8NC	No	Yes	No	Yes
BWK46L	No	Yes	No	Yes	GVUQ8B	No	Yes	No	Yes
BYRBHM	No	Yes	No	Yes	GXYJX3	Inc	Yes	Inc	Yes
BZMYXW	No	Yes	No	Yes	H2BTJ7	No	Yes	No	Yes
C42YKF	Inc	Yes	Inc	Yes	H68GZD	No	Yes	No	Yes
CA6UEN	No	Yes	No	Yes	H6EKWC	No	Yes	No	Yes
CEG3HD	No	Yes	No	Yes	H9B7NF	Inc	Yes	Inc	Yes
CFBQXN	No	Yes	No	Yes	HFCMUE	No	Yes	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
HHWGQF	No	Yes	No	Yes	LMV7HA	No	Yes	No	Yes
HK4W3R	No	Yes	No	Yes	LTPYXK	No	Yes	No	Yes
HURNQ6	No	Yes	No	Yes	LUZWAF	No	Yes	No	Yes
J2C4Y9	Inc	Yes	Inc	Yes	LWKX43	No	Yes	No	Yes
J8BPL3	No	Yes	No	Yes	LZNIJZF	No	Yes	No	Yes
JBDDJD	No	Yes	No	Yes	M8JTZC	No	Yes	No	Yes
JD6MDE	Inc	Yes	Inc	Yes	ME7NR9	No	Yes	No	Yes
JECWFJ	No	Yes	No	Yes	MELYGZ	No	Yes	No	Yes
JEUX7T	No	Yes	No	Yes	MFH9UQ	No	Yes	No	Yes
JNGUAE	No	Yes	No	Yes	MG8U7E	Inc	Yes	Inc	Yes
JPF42B	No	Yes	No	Yes	MJRV2Z	No	Yes	No	Yes
JVYCJF	No	Yes	No	Yes	MJYTKD	No	Yes	No	Yes
JXNJ4D	Inc	Yes	Inc	Yes	MKN4DQ	No	Yes	No	Yes
JZXH4D	No	Yes	No	Yes	MMURQV	Inc	Yes	Inc	Yes
KDE3VK	Yes	Yes	Yes	Yes	MT4LA8	No	Yes	No	Yes
KGYM7F	No	Yes	No	Yes	MT4MV6	No	Yes	No	Yes
KJLJCL	No	Yes	No	Yes	MVNR89	No	Yes	No	Yes
KJME3J	No	Yes	No	Yes	MW29FF	No	Yes	No	Yes
KL9623	No	Yes	No	Yes	MYBEZW	Inc	Yes	Inc	Yes
KMNHU7	No	Yes	No	Yes	N6RDN8	Inc	Yes	Inc	Yes
KP98CX	No	Yes	No	Yes	N6XEZA	No	Yes	No	Yes
KQMNHJ	No	Yes	No	Yes	N9U3GG	No	Yes	No	Yes
KT9H6C	No	Yes	No	Yes	NFVG2H	No	Yes	No	Yes
KUNMZ4	Inc	Yes	Inc	Yes	NN7T73	No	Yes	No	Yes
KXKFQD	No	Yes	No	Yes	NP22MY	No	Yes	No	Yes
KXM2MT	No	Yes	No	Yes	NP32JT	No	Yes	No	Yes
KZUJJ4	No	Yes	No	Yes	NPZGMC	No	Yes	No	Yes
L4MXN6	No	Yes	No	Yes	NQDYUP	No	Yes	No	Yes
L8LDWT	No	Yes	No	Yes	NXULHY	No	Yes	No	Yes
L92KD4	No	Yes	No	Yes	NYQUVP	No	Yes	No	Yes
LGUTZF	No	Yes	No	Yes	PA2PMT	Inc	Yes	Inc	Yes
LHP43A	Inc	Yes	Inc	Yes	PEEMTV	No	Yes	No	Yes
LMGHH4	No	Yes	No	Yes	PHVMGN	No	Yes	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
PLV7AA	No	Yes	No	Yes	V66B3Q	Inc	Yes	Inc	Yes
PLWX7W	No	Yes	No	Yes	V8D73W	No	Yes	No	Yes
PTE9HC	No	Yes	No	Yes	V8YPXW	Inc	Yes	Inc	Yes
PV3VX7	Inc	Yes	Inc	Yes	VAPY4Q	No	Yes	No	Yes
PZB4FA	No	Yes	No	Yes	VBVJP7	No	Yes	No	Yes
Q29RH7	No	Yes	No	Yes	VCA63E	No	Yes	No	Yes
Q3CQ86	No	Yes	No	Yes	VEEFDW	No	Yes	No	Yes
Q67C2W	Inc	Yes	Inc	Yes	VHEKAP	Inc	Yes	Inc	Yes
QBUZV2	Inc	Yes	Inc	Yes	VJQGGE	No	Yes	No	Yes
QETDG7	No	Yes	No	Yes	VLC7Y7	No	Yes	No	Yes
QFMYAW	Inc	Yes	Inc	Yes	VQRV42	Inc	Yes	Inc	Yes
QKJQG9	No	Yes	No	Yes	VR3KLT	Inc	Yes	Inc	Yes
QLQ3ZV	No	Yes	No	Yes	VWH6AT	No	Yes	No	Yes
QPPEXG	No	Yes	No	Yes	VXQ8A7	No	Yes	No	Yes
QQQAME	No	Yes	No	Yes	W3JKXF	No	Yes	No	Yes
QVFRXJ	No	Yes	No	Yes	W4QBCA	No	Yes	Inc	Yes
R6YKN7	No	Yes	No	Yes	W9H99T	No	Yes	No	Yes
R84DH6	No	Yes	No	Yes	WC9BF2	No	Yes	No	Yes
RCGXM6	Inc	Yes	Inc	Yes	WHRTEV	Inc	Yes	Inc	Yes
RP7VTA	No	Yes	Inc	Yes	WM2ZRT	No	Yes	No	Yes
T3AJGW	No	Yes	No	Yes	WQ9A86	No	Yes	No	Yes
T3RK6K	No	Yes	No	Yes	WREJAA	No	Yes	No	Yes
TBKX3Y	Inc	Yes	Inc	Yes	WUZMH8	No	Yes	No	Yes
TEMX3V	No	Yes	No	Yes	WXL8T3	No	Yes	No	Yes
TFFPE3	No	Yes	No	Yes	WZCBH4	No	Yes	No	Yes
TH39CT	Inc	Yes	Inc	Yes	WZRJ32	Yes	Yes	Yes	Yes
TME9FC	No	Yes	No	Yes	X8LAB7	No	Yes	No	Yes
TRTW8W	No	Yes	No	Yes	XB8VM2	No	Yes	No	Yes
TWLU3E	No	Yes	No	Yes	XDBUEL	No	Yes	No	Yes
UBYNM3	Inc	Yes	Inc	Yes	XDVHRA	No	Yes	No	Yes
ULFF87	No	Yes	No	Yes	XKRDP9	No	Yes	No	Yes
URL6U7	No	Yes	No	Yes	XLT464	No	Yes	Inc	Yes
V3JHAW	No	Yes	No	Yes	XPM6ZQ	No	Yes	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
Y36CAW	Inc	Yes	Inc	Yes					
Y3ARPH	Inc	Yes	Inc	Yes					
Y3CCLX	No	Yes	No	Yes					
Y4ZYQ7	No	Yes	No	Yes					
Y6DDLX	No	Yes	No	Yes					
YB2ZEF	Inc	Yes	Inc	Yes					
YBP9LX	No	Yes	No	Yes					
YBWUN6	No	Yes	No	Yes					
YG9QJ7	No	Yes	No	Yes					
YPN8D2	No	Yes	No	Yes					
YT842R	No	Yes	No	Yes					
YTGKPP	No	Yes	No	Yes					
YZ4WER	No	Yes	No	Yes					
Z4233W	No	Yes	No	Yes					
Z4LLAP	No	Yes	No	Yes					
Z9VYT9	No	Inc	No	Yes					
Z9WUCE	No	Yes	No	Yes					
ZFCEFQ	No	Yes	No	Yes					
ZFVJTJ	No	Yes	No	Yes					
ZPFPQM	No	Yes	No	Yes					
ZV73RB	No	Yes	No	Yes					
ZZVLPY	No	Yes	No	Yes					

Response Summary					Participants: 280
<i>Were any of the recovered questioned bullets (Items 2-5) fired in the same firearm as the known bullets (Item 1)?</i>					
<b>Responses</b>		<u>Item 2</u>	<u>Item 3</u>	<u>Item 4</u>	<u>Item 5</u>
	Yes	<b>2 (0.7%)</b>	<b>279 (99.6%)</b>	<b>2 (0.7%)</b>	<b>280 (100.0%)</b>
	No	<b>227 (81.1%)</b>	<b>0 (0.0%)</b>	<b>223 (79.6%)</b>	<b>0 (0.0%)</b>
	Inc	<b>51 (18.2%)</b>	<b>1 (0.4%)</b>	<b>55 (19.6%)</b>	<b>0 (0.0%)</b>

# Conclusions

TABLE 2

WebCode	Conclusions
23HHTJ	Item 1 and item 3 and item 5 are fired by the same firearm.
23ZEEQ	Items 3, 5 and 1 were fired from the same firearm. Items 2 and 4 were not fired from the same firearm as Item 1. It cannot be determined if Items 2 and 4 were fired or were not fired from the same firearm.
298VWR	The two (2) fired bullets, items 3 and 5, were identified as having been fired from the same firearm which fired item 1. The two (2) fired bullets, items 2 and 4, were identified as having been fired from a second firearm, but were not fired from the firearm which fired item 1. The two (2) fired bullets, items 2 and 4, were determined to be most consistent with bullets commonly loaded in 9mm Luger caliber cartridges exhibiting six (6) lands and grooves with a right hand twist. Firearms manufactured with general rifling characteristics (GRC's) similar to these items include, but are not limited to: American Eagle, Arcus, Armalite, Beretta, Browning, Calico, Caracal, Ceska Zbrojovka, Colt, Daewoo, Diamondback, EAA Corp, FEG, FM, FMJ, FMJ (Cobray), FN/Browning, Heckler & Koch, Hi-Point Firearms, Indust. Argentina, Kahr Arms, Keltec, KSN Industries, Luger, Masterpiece Arms, Mauser, Navy Arms, Norinco, Radom, Ruger, Sardius, Springfield Inc, Steyr, Steyr-Mannlicher, SWD Inc, Tanfoglio, Tanfoglio (EAA), Taurus, Tisas, Vulcan Armament, Walther, Wilkinson Arms, and Zastava.
2F7PNY	Items 1 through 5 The Items 2 through 5, fired 9mm bullets and test fires (Item 1) were examined and microscopically compared to each other with the following results: Items 2 and 4, were eliminated as having been fired from the same firearm that fired the Item 1 test fires based on differences in individual characteristics. Items 2 and 4 were identified as having been fired from the same unknown firearm. Items 3 and 5 were identified as having been fired from the same firearm that fired the Item 1 test fires.
2HWJTF	Exhibits #3 and #5 were fired from the firearm in Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as being fired from Exhibit #1. A microscopic comparison was performed; However, there is insufficient detail of the class and/or individual characteristics for an identification or elimination.
2JPECH	The Items 2, 3, 4, and 5 bullets were compared to the Items 1A-1C bullets. It was determined that the Items 3 and 5 bullets were fired from the same firearm as the Items 1A-1C bullets. It was determined that the Items 2 and 4 bullets were not fired from the same firearm as the Items 1A-1C bullets.
2N4CJ6	The evidence in items 1 through 5 was analyzed by physical and microscopic examination. The four (4) bullets in items 2, 3, 4, and 5 were 9mm bullets which had been fired from the barrel of weapons rifled with six (6) lands and grooves, right twist. The two (2) bullets in items 2 and 4 were determined not to have been fired from the weapon which fired the three (3) bullets in item 1. The two (2) bullets in items 2 and 4 were fired from one weapon and further analysis is pending submission of another weapon for additional comparison. The two (2) bullets in items 3 and 5 were determined to have been fired from the same weapon which fired the three (3) bullets in item 1.
2Q9Z2F	1. Exhibits 1, 2, 3, 4, and 5 were visually examined and microscopically compared to each other. 2. Exhibits 1, 3, and 5 were fired from the same firearm. 3. Exhibits 2 and 4 were fired from a second firearm.
2V4GP3	Items 1, 3 and 5 were fired from the same firearm. Items 2 and 4 were not fired from the same firearm as Items 1, 3 and 5. Items 2 and 4 are inconclusive with each other.

TABLE 2

WebCode	Conclusions
2VME8U	The projectiles in Items 3 and 5 were fired in the same gun that fired the projectiles in Item 1. The projectiles in Items 2 and 4 bear class characteristics consistent with the projectiles in Item 1. However, no significant similarities in individual characteristics were observed.
333GQG	1. The Exhibit 1 bullets were microscopically compared to the Exhibits 2, 3, 4, and 5 bullets. a. Exhibits 3 and 5 were identified as having been fired in the same firearm as the Exhibit 1 bullets. b. Exhibits 2 and 4 were eliminated as having been fired in the same firearm as the Exhibit 1 bullets.
3C6WDZ	[No Conclusions Reported.]
3GYT3R	Examinations showed that the discharged bullets in Item 3 and Item 5 were discharged from the same firearm used to discharge the test fired bullets in Item 1. Examinations showed that the discharged bullets in Item 2 and Item 4 were not discharged from the same firearm used to discharge the test fired bullets in Item 1.
3KZ23V	1. The bullets described in the items 1,3 and 5, are 9mm caliber, with right rifling (R-6) and were fired by the same firearm. 2. The bullets described in the items 2 and 4, are 9mm caliber, with right rifling (R-6) and were fired by the same firearm.
3UNRR9	Items 3 and 5 were fired in the submitted 9mm Ruger pistol, model SR9C. Items 2 and 4 were fired in a second 9mm pistol. Suspect weapons include 9mm Ruger pistols; however, any suspect weapon should be submitted to the laboratory for examination.
3VEX4T	Items 3 and 5 were fired in the same firearm as item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.
3YZHD4	Unknowns #3 and #5 exhibit sufficient matching class and individual characteristics to determine that they were generated from the same firearm the created set #1. Unknown #2 and #4 exhibit different individual characteristics as set #1 and are eliminated as having originated from that gun based on the submitted test fires. Items #2 AND #4 exhibit sufficient matching class and individual characteristics to EACH OTHER to determine that they were generated from a second, different firearm.
49W86N	Item #1 test bullets and submitted fired bullets #2,3,4 and 5. These bullet have been compared microscopically with each other. They have agreement in all discernible class characteristics. Item #1,3 and 5. These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #3 and #5 were fired from the firearm that discharged the submitted test bullets, Item #1. Items #1,3 and 5 These bullets have been eliminated as having been fired from the same firearm that discharged the submitted bullets #2 and #4 due to sufficient disagreement of individual characteristics. Items #2 and #4 These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #2 and #4 were fired from the same firearm.
4CHV2H	The items 1-2-1, 1-3-1, 1-4-1, and 1-5-1 questioned bullets were microscopically compared to the item 1-1-1 test fired bullets with the following conclusions: 1) Items 1-3-1 and 1-5-1 were identified as having been fired by the same gun that test fired the item 1-1-1 bullets. These identification conclusions are based on agreement of all class characteristics and sufficient similarities of the patterns of microscopic marks observed between the items and the test fired bullet to which they were compared. 2) Items 1-2-1 and 1-4-1 were identified to each other as having been fired by the same gun. This identification conclusion is based on agreement of all class characteristics and sufficient similarities of the patterns of microscopic

TABLE 2

WebCode	Conclusions
	marks observed between the items. 3) Items 1-2-1 and 1-4-1 could not be identified or eliminated as having been fired by the same gun that test fired the item 1-1-1 bullets and the item 1-5-1 bullet. These inconclusive conclusions are based on insufficient similarities and insufficient dissimilarities in the patterns of microscopic marks observed between the items and the bullets to which they were compared.
4HQBDR	<p>Bullet Analysis: Items 2, 3, 4 and 5 are 38 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 2, 3, 4 and 5 are consistent with bullets loaded in 9mm Luger and .357 SIG caliber cartridges based upon weight and style. Items 2 and 4, the bullets, exhibit characteristics found in (but not limited to) the following firearms: American Eagle, Beretta, Browning, Ceska Zbrojovka, Colt, EAA Corp, Heckler &amp; Koch, Kahr Arms, Keltec, Norinco, Ruger, Springfield Inc, Tanfoglio, Taurus and Walther 9mm Luger caliber firearms. *Note: The firearms listed are those most commonly encountered in casework. Methodology - Comparison Microscopy: Items 3 and 5, the bullets, were fired through the barrel of the same firearm as Item 1, the bullets identified to be fired using the recovered firearm, based upon corresponding class and individual microscopic characteristics. Items 2 and 4, the bullets, were not fired through the barrel of the same firearm as Item 1, the bullets identified to be fired using the recovered firearm, based upon different individual microscopic characteristics. Items 2 and 4, the bullets, were fired through the barrel of the same firearm.</p>
4KEPZG	We strongly support the hypothesis that items 3 and 5 fired from the same firearm as the known bullets (items 1). We strongly support the hypothesis that items 2 and 4 DIDN'T fire from the same firearm as the known bullets (items 1)
4YX4LN	Items 3 and 5 were fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner (Name). Items 2 and 4 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 were not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner (name).
68LK9V	The characteristic marks on Item 3 and Item 5 were similar to Item 1. Hence, I am of the opinion that Item 3 and Item 5 were fired using Ruger SR9C 9mm Luger Handgun that fired Item 1. The characteristic marks on Item 2 and Item 4 were dissimilar to Item 1.
6B3TTN	Item #1 test bullets and submitted fired bullets #2,3,4 and 5. These bullet have been compared microscopically with each other. They have agreement in all discernible class characteristics. Item #1,3 and 5. These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #3 and #5 were fired from the firearm that discharged the submitted test bullets, Item #1. Items #1,3 and 5 These bullets have been eliminated as having been fired from the same firearm that discharged the submitted bullets #2 and #4 due to sufficient disagreement of individual characteristics. Items #2 and #4 These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #2 and #4 were fired from the same firearm.
6CUYWL	Items 3 and 5 were fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner [Name]. Items 2 and 4 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner [Name]. Items 2 and 4 were not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner [Name].
6E4TV7	Exhibits #3 and #5 were fired in Exhibit #1. Exhibits #2 and #4 were fired in the same firearm. Exhibits #2 and #4 could not be identified or eliminated as being fired in Exhibit #1.
6JV43J	Items #2 and #4 were fired in the same firearm. Items #2 and #4 could not be identified or

TABLE 2

WebCode	Conclusions
6XU86P	<p>eliminated as having been fired in Item #1. Items #3 and #5 were fired in item #1.</p> <p>Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.</p>
6XYDXK	<p>An examination showed the fired bullets contained in Items 3 and 5 had been fired in the exhibit pistol used to fire Item 1. An examination also showed the fired bullet Item 2 had been fired in the same pistol used to fire Item 4.</p>
7BE7D4	<p>A microscopic examination and comparison of the evidence described above revealed the following: Bullets (3, 5) and test fires (1.1, 1.2, 1.3) are identified as having been discharged from the SAME firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Bullets (2, 4) are identified as having been discharged from a SECOND firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.</p>
7G9YRR	<p>01-01-AA : Three fired bullets reportedly test fired from a Ruger Model SR9C, 9mm Luger caliber pistol (Item 1). The three submitted fired bullets reportedly test fired from a Ruger pistol (Item 1-01-AA) were identified as having been fired from the same firearm. Two of the submitted fired bullets (1-03-AA and 1-05-AA) were identified as having been fired from the same firearm as the submitted bullets reportedly test fired from a Ruger pistol (1-01-AA) due to consistent and reproducible marks. Two of the submitted fired bullets (1-02-AA and 1-04-AA) were not eliminated or identified as having been fired from the same firearm as the submitted fired bullets reportedly test fired from a Ruger pistol (1-01-AA) due to an agreement of class characteristics but a lack of consistent and reproducible marks. 01-02-AA : One fired bullet (Item 2): The submitted fired bullet (Item 1-02-AA) was identified as having been fired from the same firearm as one of the other submitted fired bullets (Item 1-04-AA) due to consistent and reproducible marks. Unable to identify or eliminate the submitted fired bullet (1-02-AA) as having been fired from the same firearm as the three submitted fired bullets reportedly test fired from a Ruger pistol (1-01-AA) or the other two submitted fired bullets (Items 1-03-AA and 1-05-AA) due to an agreement of class characteristics but a lack of consistent and reproducible marks. 01-03-AA : One fired bullet (Item 3): The submitted fired bullet (1-03-AA) was identified as having been fired from the same firearm as the three submitted fired bullets reportedly fired from a Ruger pistol (1-01-AA) and one of the other submitted fired bullets (Item 1-05-AA) due to consistent and reproducible marks. Unable to identify or eliminate the submitted fired bullet (Item 1-03-AA) as having been fired from the same firearm as the two other submitted fired bullets (Items 1-02-AA and 1-04-AA) due to an agreement of class characteristics but a lack of consistent and reproducible marks. 01-04-AA : One fired bullet (Item 4): The submitted fired bullet (Item 1-04-AA) was identified as having been fired from the same firearm as one of the other submitted fired bullets (Item 1-02-AA) due to consistent and reproducible marks. Unable to identify or eliminate the submitted fired bullet (1-04-AA) as having been fired from the same firearm as the three submitted fired bullets reportedly test fired from a Ruger pistol (1-01-AA) or the other two submitted fired bullets (Items 1-03-AA and 1-05-AA) due to an agreement of class characteristics but a lack of consistent and reproducible marks. 01-05-AA : One fired bullet (Item 5): The submitted fired bullet (1-05-AA) was identified as having been fired from the same firearm as the three submitted fired bullets reportedly fired from a Ruger pistol (1-01-AA) and one of the other submitted fired bullets (Item 1-03-AA) due to consistent and reproducible marks. Unable to identify or eliminate the submitted fired bullet (Item 1-05-AA) as having been fired from the same firearm as the two other submitted fired bullets (Items 1-02-AA and 1-04-AA) due to an agreement of class</p>

TABLE 2

WebCode	Conclusions
	characteristics but a lack of consistent and reproducible marks.
7HXAK7	The above evidence was microscopically examined and inter-compared. In my opinion, items 3 and 5 are identified as being fired in the Ruger SR9C Luger pistol that fired the submitted bullets labeled Item 1. It is also my opinion, items 2 and 4 were fired from the same firearm, however, they were not fired from the same firearm as item 1.
7MDKWN	Item 1 (known test fired bullet standards) were microscopically compared to Items 2, 3, 4 and 5 (questioned fired bullets). Items 1, 3 and 5 (fired bullets) were fired from the same firearm. Items 2 and 4 (fired bullets) were fired from the same firearm. Items 1, 3 and 5 (fired bullets) were fired from a different firearm than Items 2 and 4 (fired bullets).
7NNH8K	I made an examination of the submitted projectiles using a comparison microscope. This type of examination allows two items to be examined so that microscopic features caused by firing through the barrel of a firearm can be compared and assessed. As a result of this examination I found that the submitted exhibit projectiles Items 3 and 5 had been fired through the same barrel as the test fired projectiles from the recovered firearm Item 1. Exhibit Items 2 and 4 were fired by a different firearm.
7RPL2T	The two submitted fired projectiles, Item 3 & 5, were fired from the same firearm as the submitted test fired projectiles, Item 1, reportedly from a Ruger model SR9C 9mm Luger caliber pistol. The two submitted fired projectiles, Items 2 & 4, were fired from the same unknown firearm. It is inconclusive if the submitted fired projectiles, Items 2 & 4 were fired from the same firearm as the submitted test fired projectiles, Item 1, reportedly from a Ruger model SR9C 9mm Luger caliber pistol, due to matching class characteristics and a lack of repeatable individual characteristics.
7UEWU7	Items 1, 3 and 5 were discharged from the same firearm. Items 2 and 4 were discharged from the same firearm but different to the firearm that discharged items 1, 3 and 5.
7VN3C2	Items 1, 3 and 5 were identified as having been fired from the same firearm based on an agreement of class characteristics and sufficient agreement of individual characteristics. Item 2 and 4 were inconclusive and could not be identified to each other or when compared to the Item 3 group. Agreement of class characteristics but insufficient agreement of individual characteristics.
7XCFW6	Bullets (3, 5) and test fire bullets (1.1, 1.2, 1.3) are identified as having been fired from the SAME firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Bullets (2, 4) are identified as having been fired from a SECOND firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
7XUMY2	Items #1, #3 and #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #1, #3 and #5 are identified as having been fired from the same firearm. Items #2 and #4 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #2 and #4 are identified as having been fired from the same firearm. Item #1 was microscopically examined and compared to Items #2 and #4. Based on the observed disagreement of individual characteristics, Item #1 is eliminated as having been fired from the same firearm as Items #2 and #4. A list of suspect weapons that could have fired the Item #2 and Item #4 expended bullets is too long for routine publication, but can be furnished upon request. The evidence will be returned to the submitter.

TABLE 2

WebCode	Conclusions
82679U	Using a comparison microscope I compared the firing marks present on the bullets test-fired in the gun (item 1) to the bullets (items 2, 3, 4, 5) and found there was significant matching detail. In my opinion items 3 and 5 had been fired in the gun (item 1). Further, in my opinion items 2 and 4 were not fired in the gun (item 1). There were significant differences in the firing marks.
83JJ2X	[No Conclusions Reported.]
84FWNQ	The two submitted fired bullets, Items 3 and 5, were fired from the Ruger pistol. The two submitted fired bullets, Items 2 and 4, could neither be identified nor eliminated as having been fired from the Ruger pistol.
8669G4	On examination I found: i)The characteristic fine striations on item 1, item 3 and item 5 are similar. Hence I am of the opinion that item 3 and item 5 were fired from the recovered firearm. ii)The characteristic fine striations on item 1 are different from item 2. Hence I am of the opinion item 2 was not fired from the recovered firearm. iii)The bullet item 4 was distorted and severely damage. Therefore there are insufficient striation marks to compare with test fired bullet item 1.
899YQ6	Projectiles B (Item 3) and D (Item 5) were fired in the submitted 9mm Ruger pistol, model SR9C (Item 1). Projectiles A (Item 2) and C (Item 4)were fired in a second 9mm pistol, with similar class characteristics as the submitted 9mm Ruger pistol.
8C98YL	Item 1: Three bullets fired using the recovered firearm (known). RESULTS: The Item 1 bullets were physically examined and microscopically compared with each other. Matching individual identifying characteristics were found, and it was concluded that the Item 1 bullets were all fired by the same firearm (barrel). Item 2: First bullet recovered from the wall at the scene (questioned). Item 3: Second bullet recovered from the wall at the scene (questioned). Item 4: Bullet recovered from victim (questioned). Item 5: Bullet recovered from the ceiling at the scene (questioned). RESULTS: Items 2 – 5 were physically and microscopically examined. These Items were also microscopically compared with each other and with the three Item 1 fired bullets. These examinations and comparisons revealed the following: Items 2 – 5 were most consistent with bullets loaded into some 9mm Luger caliber cartridges based on their observable physical characteristics. Matching individual identifying characteristics were found on Items 3, 5, and the Item 1 bullets. It was concluded that Items 1, 3, and 5 were all fired by the same firearm (barrel). Matching individual identifying characteristics were found on Items 2 and 4. It was concluded that Items 2 and 4 were both fired by the same firearm (barrel); however, due to differences in individual identifying characteristics, Items 2 and 4 were not fired by the firearm (barrel) that fired Items 1, 3, and 5. Items 2 and 4 may be suitable for identification with a specific firearm (barrel) and/or with another fired bullet(s). Items 2 and 4 had been fired through a conventionally rifled barrel with six grooves, right twist. Based on the general rifling characteristics found on Items 2 and 4, a list of possible makes and/or origins of firearms in 9mm Luger caliber that could have fired these Items was extensive, and therefore, not reported. If a firearm is recovered, contact the examiner listed below prior to submitting the firearm for examination.
8DH4FJ	2.) I examined the fired bullets marked Item 1 - Item 5 and compared the individual and class characteristic markings transferred to them by firearm components during the firing process using a comparison microscope and found as follows: 2.1) The bullets marked Item 1, Item 3 and Item 5 were fired from the same firearm. 2.2) The bullets marked Item 2 and Item 4 were fired from a second firearm.
8DKPCY	The bullets identified item 3 (Located in "wall at the scene") and item 5 (Located in "ceiling at

TABLE 2

WebCode	Conclusions
	the scene") were fired by gun type firearm, Ruger, SR9C, 9mm Luger caliber, located in the "residence of the suspect". The bullets identified item 2 (Located in "wall at the scene") and item 4 (Located in "victim") YES were fired by the same firearm, but were NOT fired by the firearm pistol type, Ruger, SR9C, caliber 9mm Luger, located in the "residence of the suspect".
8DNEFW	comparison microscopic examination reveal that: 1- the bullets recovered mentioned in item no:3 and no:5 are fired from recovered firearm mentioned in item no:1. 2- the bullets recovered mentioned in item no:2 and no:4 are fired from one another firearm.
8ET2RF	Items 3 and 5 were fired from the recovered known firearm, Item 1. Items 2 and 4 were fired from the same firearm. Items 2 and 4 could not be identified or eliminated as being fired from the recovered known firearm, Item 1.
8JM3PM	The recovered firearm (seized from the suspect) was used at the shooting that occurred at a residence. The bullet(item3) recovered from the wall and the bullet(item 5) recovered from the ceiling are in sufficient agreement with item 1 (test fired bullet) and identified as having a common origin, that item 3, item 5 and item 1(test fire) were fired from the same barrel.
8N62PW	First of all, we compared the known bullets from Item 1 among each other. They all showed enough reproducible individual details for a comparison. The questioned bullets items 2 -5 each show enough details for a comparison. By comparing items 2 - 5 to item 1 we found that it is certain, that item 3 and item 5 has been fired by the same gun as item 1. Item 2 and item 4 haven't been fired by the recovered gun, but it is highly probable, that item 2 and item 4 have been fired by the same gun.
8NYQPJ	Items 1, 3 and 5 were fired from the same firearm. Items 2 and 4 were fired from a second firearm.
8U7GRP	made the microscopic comparison between the test fired the firearm RUGER Model SRC9C 9 mm Luger and the projectiles recovered at the scene, it was determined that these have identity characteristics with the samples marked as bullet number three and bullet number five, in the same way samples bullet number two and bullet number four do not present characteristics of identity with test fired in the firearm RUGER Model SRC9C 9 mm Luger.
8U93N7	Items 3 and 5 bullets were fired from the same firearm that fired the Item 1 test-fired bullets. Items 2 and 4 bullets were not fired in the same firearm that fired the Item 1 test-fired bullets. These bullets were fired in a one firearm and are consistent with bullets commonly found loaded in some 9mm Luger caliber cartridges. See the attachment for a list of firearm manufacturers/origins that may have fired these bullets. Note, this list may not be all inclusive. Item 4 piece of gray in color metal is consistent with being a lead core and is unsuitable for microscopic comparison. [Attachment not provided by participant].
8ZAF8L	Exhibits #3 and #5 were fired in Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as having been fired in Exhibit #1.
96G9VP	Items #3 and #5 were both fired from same firearm as the known bullets. Items #2 and #4 were both fired from the same firearm however they were not fired from the same firearm as the known bulles.
96JUQ7	Item (2) to (5) each consisted of one fired bullet in 9mm calibre. Microscopic examination on the fired bullets in Item (1) to (5) showed that Item (3) and (5) were fired from the same firearm that had fired Item (1).
987FFM	THE Class characteristics ( L&G width , 6 right twist conventional grooves) of all investigated projectiles Item 1-5 are consistent with a Ruger SR9C 9x19 mm handgun. The individual

TABLE 2

WebCode	Conclusions
	characteristics ( stria in the groove- and on the land -impressions however show 2 different groups of sources. Item 3 ( wall) and Item 5 ( ceiling) are consistent with the reference projectiles Item 1 A, 1B,1C and are shot with the questioned firearm Ruger SR9C 9mm Para handgun. Item 2 ( wall 1) and Item 4 (victim) are not shot true the barrel of the questioned SR9c handgun .
9GXV6Q	The Item 1 (three bullets discharged from the suspect's weapon) and the four bullets (Items 2, 3, 4 and 5) were microscopically examined and compared. Based upon matching microscopic, two of the bullets (Items 3 and 5) were identified as having been fired in the suspect's firearm (Item 1). The remaining bullets (Item 2 and 4) was fired in a different firearm.
9GZGZ7	Items 2, 3, 4, and 5 have physical and design characteristics consistent with being .38/.357/9mm caliber. Items 1 (test fired bullets), 3, and 5 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, Items 3 and 5 were identified as having been fired from the same firearm that fired Item 1 (Ruger SR9C semiautomatic pistol). Items 2 and 4 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, Items 2 and 4 were identified as having been fired from the same firearm. Items 2 and 4 were microscopically examined and compared to Item 1 (test fired bullets). Agreement of class characteristics was observed. However, there is insufficient agreement or disagreement of individual characteristics to either identify or eliminate Items 2 and 4 as having been fired from the same firearm that fired Item 1 (Ruger SR9C semiautomatic pistol). A list of firearms that could have fired Items 2 and 4, other than the firearm that fired Item 1 (Ruger SR9C semiautomatic pistol), is too large for inclusion in this report, but can be provided upon request.
9J72QR	The bullets Items 3 and 5 were discharged from the same firearm as Test bullets Item 1(Suspect's firearm). The bullets Items 2 and Item 4 were not discharged from the same firearm as test bullets Items 1 (Suspect's firearm). The bullets Item 2 and Item 4 were discharged from separate firearms.
9NY7JW	Examined the three specimens marked Item #1. They are 9mm Luger caliber full metal jacketed bullet test standards. Examined the specimens marked #2, #3, and #5. They weigh 115.2, 115.3, and 114.9 grains respectfully, and each indicates six lands and six grooves with a right hand twist. They are 38 caliber class discharged full metal jacketed bullets. Examined the specimen marked #4. It weighs 122.6 grains and indicates six lands and six grooves with a right hand twist. It is a 38 caliber class discharged metal jacketed expanding type bullet. The two bullet specimens marked #3 and #5 were compared microscopically against the test standards and were identified as having been discharged from the submitted pistol. The two bullet specimens marked #2 and #4 were compared microscopically against each other and the test standards. Although they exhibit the same general class characteristics, the results of the microscopic comparisons were inconclusive. It was not possible to identify or eliminate the items as having been discharged from the submitted pistol.
9PTVJJ	Items 1, 3 and 5 were fired from the same firearm. Items 4 and 2 were fired from a second firearm.
9U3A8A	Item 3 and Item 5 are .38 caliber (9mm) family copper full metal jacket bullets that were identified as having been fired from the barrel of the Item 1 pistol. Item 2 and Item 4 are .38 caliber (9mm) family copper full metal jacket and copper jacketed-hollow point bullets, respectively, that were fired from a barrel rifled with six grooves, right twist. The Item 2 and Item 4 bullets were identified as having been fired from the same barrel. However, due to a lack of sufficient agreement in the individual characteristics, the Item 2 and Item 4 bullets were

TABLE 2

WebCode	Conclusions
	<p>inconclusive as having been fired from the barrel of the Item 1 pistol. A check of the Laboratory's General Rifling Characteristics (GRC) database produced a list of firearms with GRCs like those present on the Item 2 and Item 4 bullets that includes pistols marketed by Browning, Llama, Norinco, Ruger, Tanfoglio, Taurus and Taurus and revolvers marketed by Rossi and Taurus.</p>
9VTH9X	<p>The cartridge cases in items 3 and 5 were fired in the same gun that fired the cartridge cases in item 1. The cartridge cases in items 2 and 4 were not fired in the same gun that fired the cartridge cases in item 1.</p>
9ZD3KT	<p>The fired bullets, Items 3 and 5, were microscopically examined and compared with the test fired bullets, Item 1. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 3 and 5 are identified as having been fired from the same firearm as the test fired bullets, Item 1. The fired bullets, Items 2 and 4, were microscopically examined and compared with one another. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 2 and 4 are identified as having been fired from the same firearm. The fired bullets, Items 2 and 4 were microscopically examined and compared with the test fired bullets, Item 1. There is observed agreement of their class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate them as having been fired from the same firearm as the bullets from Item 1.</p>
9ZVCDU	<p>Item 1 is three known 9mm caliber bullets test fired from a Ruger 9mm Luger handgun, model SR9C. Item 1 exhibits conventional style rifling consisting of six land and groove impressions with a right twist. Items 2, 3, 4 and 5 are 9mm caliber fired bullets exhibiting conventional style rifling consisting of six land and groove impressions with a right twist. Item 1 was microscopically compared to items 2, 3, 4, and 5. Based on agreement of all discernible class characteristics and sufficient agreement of individual characteristics, items 3 and 5 were identified as having been fired by the same firearm as the known bullets (item 1). Agreement of all discernible class characteristics and some disagreement of individual characteristics was observed between items 2 and 4 to item 1; however, it was insufficient to support an elimination. Therefore, items 2 and 4 could not be identified nor eliminated as having been fired by the same firearm which fired item 1. Items 2 and 4 were microscopically compared to each other. Based on discernible class characteristics and sufficient agreement of individual characteristics, items 2 and 4 were identified as having been fired by the same unknown firearm.</p>
A48CC8	<p>Laboratory Item (001.B) (Item 2) spent bullet is eliminated as being fired by the same firearm as Laboratory Item (001.A) (Item 1) test fire from recovered firearm Ruger model SR9C 9mm Luger pistol. Laboratory Item (001.B) (Item 2) spent bullet is identified as being fired by the same firearm as Laboratory Item (001.D) (Item 4) spent bullet. Laboratory Item (001.C) (Item 3) spent bullet is identified as being fired by the same firearm as Laboratory Item (001.A) (Item 1) test fire from recovered firearm Ruger model SR9C 9mm Luger pistol. Laboratory Item (001.D) (Item 4) spent bullet is eliminated as being fired by the same firearm as Laboratory Item (001.A) (Item 1) test fire from recovered firearm Ruger model SR9C 9mm Luger pistol. Laboratory Item (001.E) (Item 5) spent bullet is identified as being fired by the same firearm as Laboratory Item (001.A) (Item 1) test fire from recovered firearm Ruger model SR9C 9mm Luger pistol.</p>
A4MZ77	<p>The evidence in items 1 through 5 was analyzed by physical and microscopic examination. The four (4) bullets in items 2 through 5 were 9mm bullets which had been fired from the barrels of weapons rifled with six (6) lands and grooves, right twist. The two (2) bullets in items 3 and 5 were determined to have been fired from the same firearm as the three (3) known bullets in</p>

TABLE 2

WebCode	Conclusions
	item 1. The two (2) bullets in items 2 and 4 were determined not to have been fired from the same firearm as the three (3) known bullets in item 1. The two (2) bullets in items 2 and 4 were fired from the same firearm. Further analysis is pending submission of another firearm for additional comparison.
A6K7R8	The fired bullets in Item #3 and Item #5 were fired from the firearm in Item #1. The fired bullets in Item #2 and Item #4 were fired from the same firearm. The fired bullets in Item #2 and Item #4 could not be identified or eliminated as having been fired from the firearm in Item #1.
A79PMD	Bullets marked Item 3; 5 were fired in the same firearm as the known bullet "Item 1". Bullets marked Item 2; 4 were not fired in the same firearm as the known bullets "Item 1".
ABM84U	Items 1, 3 and 5 were fired from the same firearm. Items 2 and 4 were fired from a second firearm.
AF6DTG	Items 3 and 5 were identified microscopically as having been fired from the same firearm that fired Items 1A-1C, based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were identified microscopically as having been fired from the same unknown firearm based on agreement on the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were eliminated as having been fired from the same firearm that fired Items 1A-1C, due to disagreement of individual characteristics.
AGVLU7	Based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets from Items 1,3, and 5 were identified as having been fired from the same firearm. Based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Items 2 and 4, were identified as having been fired from the same firearm. Based on significant disagreement of individual characteristics the fired bullets from Items 1,3, and 5, could not have been fired from the same firearm as the fired bullets, Items 2 and 4.
AH7MEJ	Items 2 through 5 (1.2-1.5) have been examined and compared microscopically with the test fired bullets, Item 1 (1.1). Based on the observed agreement of their class characteristics and sufficient agreement of individual characteristics, Items 3 (1.3) and 5 (1.5) are identified as having been fired from the same firearm as the tests, Item 1 (1.1). Based on a difference of individual characteristics Items 2 (1.2) and 4 (1.4) were not fired from the suspect firearm. However, based on the observed agreement of their class characteristics and sufficient agreement of individual characteristics, Items 2 (1.2) and 4 (1.4) are identified as having been fired from the same firearm.
AHZDFR	All Items were microscopically examined and compared with the following conclusions:Item3 and Item5 had been fired in the same firearm as Item1. Item2 and Item4 had been fired in the same firearm but not the recovered one.
AQEZQG	3. On 2017-11-15 during the performance of my official duties I received a sealed evidence bag with number PA4001476939 from Case Administration of the Ballistics Section, containing the following items: 3.1 Item 1 containing the following: 3.1.1 Three (3) 9mm calibre fired bullets marked "1". 3.2 Item 2 containing the following: 3.2.1 One (1) 9mm calibre fired bullet marked "2". 3.3 Item 3 containing the following: 3.3.1 One (1) 9mm calibre fired bullet marked "3". 3.4 Item 4 containing the following: 3.4.1 One (1) 9mm calibre fired bullet marked "4". 3.5 Item 4 containing the following: 3.5.1 One (1) 9mm calibre fired bullet marked "5". 4. The intention and scope of this forensic examination comprises of the following: 5.1 The examination and identification of fired bullets. 5.2

TABLE 2

WebCode	Conclusions
	Microscopic individualization of fired bullets. 6. I examined the fired bullets mentioned in paragraphs 3.1.1, 3.2.1, 3.3.1, 3.4.1 and 3.5.1 and compared the individual and class characteristics markings on them using a comparison microscope and found: 6.1 The bullets mentioned in paragraphs 3.1.1, 3.3.1 and 3.5.1 were fired from a first (1st) firearm. 6.2 The bullets mentioned in paragraphs 3.2.1 and 3.4.1 were fired from a second (2nd) firearm.
AQX43M	Items 3 and 5 are identified as having been fired in item 1. Items 2 and 4 are eliminated from having been fired in item 1. Items 2 and 4 are identified as having been fired in the same unknown gun
B3AJUT	[No Conclusions Reported.]
BMDHRR	Items 3, 5 and 1 were fired from the same firearm. Items 2 and 4 were not fired from the same firearm as Items 3, 5 and 1. Items 2 and 4 were fired from a second firearm.
BN7AYR	In my opinion, a microscopical comparison of firing marks has shown there is sufficient agreement of class and individual characteristic markings to conclusively determine that the bullets contained in items 3 & 5 were fired from the same recovered firearm which generated the test-fired bullets contained in item 1. In my opinion, a microscopical comparison of firing marks has shown there is agreement of class characteristic markings, but significant disagreement of individual characteristic markings, therefore the bullets contained in items 2 & 4 were not fired from the recovered firearm which generated the test-fired bullets contained in item 1. However, In my opinion, a microscopical comparison of firing marks has shown there is sufficient agreement of class and individual characteristic markings to conclusively determine that the bullets contained in items 2 & 4 were fired from the same firearm. Therefore two firearms were involved in this incident.
BNCJXJ	Using the Bayesian approach in casework we view our findings under two hypotheses. In this test we used the following hypotheses: H1: The questioned bullet was fired through the barrel of the submitted firearm. H2: The questioned bullet was fired through the barrel of another firearm of the same caliber and with the same class characteristics as the submitted firearm. The likelihood ratio (LR) of the findings is expressed in the following verbal scale: Approximately equally probable (LR = 1-2). Slightly more probable (LR = 2-10). More probable (LR = 10-100). Much more probable (LR = 100-10,000). Very much more probable (LR = 10,000-1,000,000). Extremely more probable (LR = >1,000,000). Conclusions: Item 2: The findings are extremely more probable when H2 is true than when H1 is true. Item 3: The findings are extremely more probable when H1 is true than when H2 is true. Item 4: The findings are extremely more probable when H2 is true than when H1 is true. Item 5: The findings are extremely more probable when H1 is true than when H2 is true.
BNDA7M	1. The bullets described in Item 1, Item 3 and Item 5, are 9mm caliber, with right rifling (R-6)and were fired by the same firearm. 2. The bullets described in Item 2 and Item 4,are 9mm caliber, with right rifling (R-6)and were fired by the same firearm.
BQCPCP	The bullets listed as Items 3 and 5 have been identified as having been fired from the barrel of the same firearm as the bullets from Item 1. The bullets listed as Items 2 and 4 have been identified as having been fired from the barrel of the same firearm; however, they were NOT fired from the barrel of the same firearm as the bullets from Item 1.
BUDQGT	The findings provide extremely strong support for the proposition that bullets '3' and '5' were fired from the same gun as the 'known' bullets '1' rather than some other gun.
BVTYLM	The recovered questioned bullets marked "item 3" and "item 5" were fired in the same firearm as the known bullets, "item 1" ie: Bullets marked "item 3" and "item 5" were fired in the Ruger

TABLE 2

WebCode	Conclusions
	SR9C 9mm Luger handgun. The recovered questioned bullets marked "item 2" and "item 4" were not fired in the same firearm as the known bullets "item 1" ie: Bullets marked "item 2" and "item 4" were not fired in the Ruger SR9C 9mm Luger handgun.
BWK46L	The following findings reflect the professional opinion of the examiner authoring this report. Examination of the two (2) fired full metal jacket bullets (Items 3 & 5) revealed they are 9mm caliber and fired through a firearm barrel rifled with six (6) lands and grooves with a right hand twist. Microscopic examination of Items 3 & 5 with test fired bullets from Item 1 revealed Items 3 & 5 were fired through the barrel of the submitted Ruger semi-automatic pistol (Item 1). Examination of the one (1) fired full metal jacket bullet (Item 2) & one (1) fired jacketed hollow point bullet (Item 4) revealed they are 9mm caliber and fired through a firearm barrel rifled with six (6) lands and grooves with a right hand twist. Microscopic examination of Items 2 & 4 revealed they were fired through the same firearm barrel, however they were not fired through the barrel of Item 1.
BYRBHM	2.1 The fired bullets mentioned in 3.1.2 marked 519709/17 A3 and A5 were fired from the same firearm as the bullets mentioned in 3.1.1 marked 709 TB1-TB3. 2.2 The fired bullets mentioned in 3.1.2 marked 519709/17 A2 and A4 were fired from the same firearm. 2.3 The fired bullets mentioned in 3.1.2 marked 519709/17 A2 and A4 were not fired from the same firearm as the bullets mentioned in 3.1.1 marked 709 TB1-TB3.
BZMYXW	Item #3 and item #5 have been fired by or are watch with item #1. Item #2 and item #4 not match with item #1. But these two bullets are fired by some weapon or one different weapon.
C42YKF	The fired bullets in Items 2, 3, 4, and 5 were microscopically examined in conjunction with the test fired bullets in Item 1. Based on these comparative examinations, it was determined that: A) The bullets in Item 3 and Item 5 had been fired through the barrel of the recovered firearm. B) The bullets in Items 2 and 4 bear the same class characteristics as those present on Item 1. However, no similar individual characteristics were found to link the bullets in Item 2 and Item 4 with those in Item 1. The fired bullets in Item 2 and Item 4 were also microscopically examined in conjunction with one another. Based on these comparative examinations, it was determined that both of these bullets bear the same class characteristics and some similar individual characteristics as one another. However, these similarities are insufficient for a more conclusive examination. The rifling characteristics present on Items 2 and 4 are common to a variety of 9 mm caliber firearms. Some of the more commonly encountered brands include: American Eagle, Arcus, Beretta, FN/Browning, CZ, Colt, Daewoo, Diamondback, EAA, H&K, Hi-Point, IML, Intratec, Kahr Arms, Keltec, Luger, Mauser, Navy Arms, Norinco, Radom, Ruger, Sardius, Springfield Inc., Sterling Arms, Steyr, SWD Inc., Tanfoglio, Taurus, Walther and others. Any suspect weapon(s) recovered should be submitted to the lab for comparison with these items.
CA6UEN	The Items 2, 3, 4 and 5 bullets were compared to the Item 1 tests. Items 3 and 5 were fired from the same as Item 1. Items 2 and 4 were fired from a second firearm. Possible firearms that could have fired Item 2 and 4 include Pistols manufactured by Ruger among others.
CEG3HD	THE BULLETS MARKED AS ITEMS 3 AND 5 WERE FIRED FROM THE SAME FIREARM THAT FIRED ITEMS 1. THE BULLETS MARKED AS ITEMS 2 AND 4 WERE FIRED IN A SECOND FIREARM.
CFBQXN	The Items 2, 3, 4 and 5 bullets were compared to the Item 1 tests. Items 3 and 5 were fired from the same as Item 1. Items 2 and 4 were fired from a second firearm.
CFDCU4	After microscopic comparison, it was determined that Items #3 and 5 were fired from Item #1 Ruger 9mm Luger semiautomatic pistol, based on sufficient agreement of class and individual

TABLE 2

WebCode	Conclusions
	characteristics of the land impression marks. After microscopic comparison it was determined that Items #2 and 4 were fired from the same firearm based on sufficient agreement of class and individual characteristics of the land impression marks.(Firearm #2). Items #2 and 4 were not fired from Item #1 Ruger 9mm Luger semiautomatic pistol, based on differences of individual characteristics.
CLGH8L	The recovered questioned bullets, Item 3 and Item 5, were fired in the Ruger SR9C 9mm Luger handgun (recovered firearm of this case). (Match between Item 1, Item 3 and Item 5). The recovered questioned bullets, Item 2 and Item 4 were not fired in the Ruger SR9C 9mm Luger handgun (recovered firearm of this case). They were fired in the same firearm but not the one recovered of this case. (Match between Item 2 and Item 4)
CP4TRK	Proficiency Test 17-527: Firearms Examination. Participant Code [Number]. Examination of the two (2) fired full metal jacketed bullets (Items 3 & 5) revealed they are 9mm caliber and fired through a firearm barrel rifled with six (6) lands and grooves with a right hand twist. Microscopic examination of Items 3 & 5 with the reported test fired bullets (Item 1) revealed Items 3 & 5 were fired through the same firearm barrel as the reported test fired bullets in Item 1. Examination of the one (1) fired full metal jacketed bullet (Item 2) and the one (1) fired jacketed hollow point bullet (Item 4) revealed they are 9mm caliber and fired through a firearm barrel rifled with six (6) lands and grooves with a right hand twist. Microscopic examination of Items 2 & 4 revealed they were fired through the same firearm barrel. Microscopic examination of Items 2 & 4 with the reported test fired bullets (Item 1) revealed Items 2 & 4 were not fired through the same firearm barrel as the reported test fired bullets in Item 1.
CPEYJF	Item #1 test bullets and submitted fired bullets #2,3,4 and 5. These bullet have been compared microscopically with each other. They have agreement in all discernible class characteristics. Item #1,3 and 5. These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #3 and #5 were fired from the firearm that discharged the submitted test bullets, Item #1. Items #1,3 and 5 These bullets have been eliminated as having been fired from the same firearm that discharged the submitted bullets #2 and #4 due to sufficient disagreement of individual characteristics. Items #2 and #4 These bullets have sufficient agreement in corresponding individual characteristics for identification. Items #2 and #4 were fired from the same firearm.
CRPUAD	Items 3 and 5 were identified microscopically as having been fired from the same firearm that fired the test fires, Item 1, based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were identified microscopically as having been fired from the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were eliminated as having been fired from the same firearm that fired the test fires, Item 1, due to disagreement of individual characteristics.
CZECZF	Item 3 and Item 5 were fired from the same firearm as Item 1. Item 2 and Item 4 were not fired from the same firearm as Item 1. Item 2 and Item 4 are inconclusive to each other.
D9CENC	1. Exhibit fired bullets listed as item three (3) and item five (5) were identified within the limits of practical certainty as having been fired in the same firearm as item 1, the exhibit Ruger SR9C 9mm Luger calibre pistol. 2. Exhibit fired bullets listed as item 2, and 4 were eliminated as having been fired in the same firearm as item 1, the exhibit Ruger SR9C 9mm Luger calibre pistol.
DM679D	RESULTS and INTERPRETATIONS: The bullets in Items 3 and 5 were determined to have been fired from the same single firearm as the bullets in Item 1. The bullets in Items 2 and 4 were determined to have been fired in a different single firearm. EXAMINATION: The projectile from

TABLE 2

WebCode	Conclusions
	Item 4 is a 9mm Luger caliber, jacketed hollow point, Federal brand Hydra-Shok bullet that weighs approximately 123 grains. The remaining six projectiles are 9mm Luger caliber, full metal jacketed bullets that weigh approximately 115 grains each. Each of the seven bullets have marks from six lands and grooves of rifling with a right twist. The land impression widths measure .075 to .080 inch and groove impression widths measure .097 to .103 inch. The bullets in Item 1 were microscopically inter-compared. The bullets in Items 2 through 5 were microscopically compared to the bullets from Item 1. The bullets in Items 2 and 4 were microscopically compared to each other.
DMALLE	The bullets in Items 2, 3, 4, and 5 were all microscopically examined in conjunction with one another and the test fired bullets from the firearm in Item 1. Based on these comparative examinations it was determined that: a.The bullets in Items 3 and 5 were fired from the firearm in Item 1. b.The bullets in Items 2 and 4 bear the same class characteristics present on the test fired bullets from the firearm in Item 1. However, there was insufficient agreement in individual characteristics to link the bullets in Items 2 and 4 to the firearm in Item 1. c.The bullets in Items 2 and 4 bear the same class characteristics and some individual characteristics. However, these similarities do not allow for a more conclusive examination at this time. The general rifling characteristics present on the bullets in Items 2 and 4 are most commonly produced by firearms manufactured by Beretta, CZ, FN/Browning, H&K, Ruger, Taurus, Walther, and others. Suspect firearms should be submitted for comparison.
DQ83WM	The 38 caliber class bullets (Items 3 and 5) were fired from the same firearm as the known 38 caliber class bullets (Item 1). The remaining 38 caliber class bullets (Items 2 and 4) were all fired from a second unknown firearm.
DRJTYC	3. On 2017-11-17 during the performance of my official duties I received a sealed evidence bag with number PA4001476932 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 Three (3) 9mm calibre fired bullets marked by me "T1" each and "A", "B" and "C" respectively. 3.2 Four (4) 9mm calibre fired bullets marked by me "535335/17" each and "2" to "5" respectively. 4. The intention and scope of this forensic examination comprises of the following: 4.1 The examination and identification of fired bullets. 4.2 Microscopic individualization of fired bullets. 5. I examined the fired bullets mentioned in paragraphs 3.1 and 3.2 and compared the individual and class characteristics markings transferred to them during the firing process, using a comparison microscope and found that they were fired from different firearms as follows: 5.1 The bullets mentioned in paragraphs 3.2 marked "535335/17" each and "3" and "5" respectively were fired from the firearm that fired the test bullets mentioned in paragraph 3.1, a first (1st) firearm. 5.2 The bullets mentioned in paragraph 3.2 marked "535335/17" each and "2" and "4" respectively were fired from the same firearm, a second (2nd) firearm.
E2LGCU	The bullets were examined and microscopically inter-compared with the following results: The two bullets (Lab Items 3 and 5) were identified as having been fired from the same firearm that fired the test fired bullets (Lab Item 1). The two bullets (Lab Items 2 and 4) were eliminated as having been fired from the same firearm that fired the test fired bullets (Lab Item 1). The two bullets (Lab Items 2 and 4) were identified as having been fired from the same firearm.
E2NBVZ	I compared the three test fired bullets (Item 1) from the suspect firearm with each other and found reproducing marks. I found sufficient corresponding individual microscopic marks between Item 1, item 3 and item 5 to conclude that the bullets Items 3 and 5 were fired in the same firearm as used to fire the test fired bullets Item 1. Items 2 and 4 have sufficient corresponding individual microscopic marks to conclude that they were fired in a single firearm. The individual marks on items 2 and 4 are significantly different to those on items 1, 3 and 5, and in the absence of alteration, the pistol that fired item 1 did not fire items 2 and 4.

TABLE 2

WebCode	Conclusions
E3DK2V	Deformed bullets (3,5) and test fires (1.1-1.3) are identified as having been discharged from the same firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Deformed bullets (2 and 4) are identified as having been discharged from a second firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
EA269H	Items 3 and 5 were both fired in the same firearm as the known bullets labeled as Item 1. Items 2 and 4 were not fired in the same firearm as the known bullets labeled as Item 1. Items 2 and 4 were both fired in one and the same firearm.
EC7TQT	Items 3 and 5 are two (2) fired 9mm caliber copper jacketed, full metal jacket bullets that were identified as having been fired from the firearm that test fired the Item 1 bullets. Items 2 and 4 are two (2) 9mm/38 class caliber copper jacketed bullets (one (1) full metal jacket (#2) and one (1) jacketed hollow point (#4)) that were fired from a barrel with six (6) lands and grooves, right twist, and were identified as having been fired from the same firearm. Items 2 and 4 were not fired in the firearm that fired the Item 1 bullets, or Items 3 and 5. Please see the attached list of firearms that produce rifling impressions like those on Items 2 and 4; and note that this list is not all inclusive [Attachment not provided by participant].
EEU8BW	Bullets (Items # 2, 3, 4, 5) and Test Fires (Items 1.1, 1.2, 1.3) were microscopically examined and compared. Bullets (Items # 3, 5) and Test Fires (1.1, 1.2, 1.3) are identified as having been discharged from the same firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Bullets (Items # 2, 4) are identified as having been discharged from a second firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
EPBRWD	Items A-2 and A-4 Microscopic comparison of these bullets revealed that they have the same class of rifling and sufficient corresponding individual marks to conclude they were discharged in the same unknown firearm. Microscopic comparison of these bullets to item A-1b revealed that they have similar class of rifling marks, but significant disagreement in individual marks. These bullets were not discharged in the Ruger pistol. Items A-3 and A-5 Microscopic comparison of these bullets to item A-1b revealed that they have the same class of rifling and sufficient corresponding individual marks to conclude they were discharged in the same Ruger pistol. In summary, items A-2 and A-4 were discharged in the same unknown firearm, and items A-3 and A-5 were discharged in the Ruger pistol.
ETQJM7	Bullet Analysis: Items 2, 3, 4 and 5 are 38 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 2, 3, 4 and 5 are consistent with bullets loaded in 9mm Luger and .357 SIG, caliber cartridges based upon the weight and style. Items 2 and 4, the bullets exhibit characteristics found in (but not limited to) the following firearms: Beretta, Colt, FN/Browning, Kahr Arms, KelTec, Ruger, Springfield INC, SWD INC, Tanfoglio (EAA) and Walther 9mm Luger caliber firearms. *Note: The firearms listed are those most commonly encountered in casework. Methodology - Comparison Microscopy: Items 3 and 5, the bullets, were fired through the barrel of the same firearm as Item 1, the bullets identified to be test fired from the suspect's firearm, based upon corresponding class and individual microscopic characteristics. Items 2 and 4, the bullets, were not fired through the barrel of the same firearm as Item 1, the bullets identified to be test fired from the suspect's firearm, based different individual microscopic characteristics.
EVZBWM	A test fired bullet from Item 1 was microscopically examined and compared with a recovered fired bullet, Item 3. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 3 is identified as having been fired

TABLE 2

WebCode	Conclusions
	<p>from the same pistol as Item 1. A test fired bullet from Item 1 was microscopically examined and compared with a recovered fired bullet, Item 5. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 5 is identified as having been fired from the same pistol as Item 1. The test fired bullets, Item 1, were microscopically examined and compared with a recovered fired bullet, Item 2. There is observed agreement of their class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate Item 2 as having been fired from the same pistol as Item 1. The test fired bullets, Item 1, were microscopically examined and compared with a recovered fired bullet, Item 4. There is observed agreement of their class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate Item 4 as having been fired from the same pistol as Item 1. A recovered fired bullet, Item 2, was microscopically examined and compared with a recovered fired bullet, Item 4. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 2 and Item 4 are identified as having been fired from the same firearm.</p>
FDVNJE	<p>Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm.</p>
FENC6V	<p>Exhibits #2 through #5 are of 9 mm/38 class caliber exhibiting six land and groove impressions with a right hand twist. Exhibits #2 and #4 were fired from the same firearm. Exhibits #3 and #5 were fired from the firearm in Exhibit #1. Exhibits #2 and #4 could not be identified or eliminated as having been fired from the firearm in Exhibit #1.</p>
FKELEU	<p>A microscopic examination and comparison of the evidence described above revealed the following: Bullets (3,5) and Test Fires (1.1-1.3) are identified as having been discharged from the SAME gun based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Bullets(2,4)are identified as having been discharged from a SECOND gun based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.</p>
G7P3FH	<p>The two submitted 9mm Luger caliber bullets, items 3 and 5, were fired from the same weapon which fired the submitted bullets, item 1. The two submitted 9mm Luger caliber bullets, items 2 and 4, were fired from the same weapon. Items 2 and 4 were not fired from the same 9mm Luger caliber firearm which fired the submitted bullets, items 1, 3, and 5. A possible firearms manufacturers list of right hand twist with six lands and grooves weapons was generated for items 2 and 4 but are too numerous to list.</p>
GFFQBK	<p>Items 1-5 were compared microscopically with each other. Items 1,3,and 5 were found to have a sufficient quantity and quality of matching individual characteristics in their rifling striations, thus it is the opinion of this Examiner that they were fired from the same firearm. Items 2 and 4 were found to have a sufficient quantity and quality of matching individual characteristics in their rifling striations, thus it is the opinion of this Examiner that they were fired from the same firearm (but not the same firearm that fired Items 1,3,and 5).</p>
GMF8NC	<p>Item: 1 Three fired bullets, listed as "...fired using the recovered firearm (known)." Item: 2 One fired bullet, listed as "First bullet recovered from the wall at the scene (questioned)." Item: 3 One fired bullet, listed as "Second bullet recovered from the wall at the scene (questioned)." Item: 4 One fired bullet, listed as "Bullet recovered from victim (questioned)." Item: 5 One fired bullet, listed as "Bullet recovered from the ceiling at the scene (questioned)." RESULTS: Items 1 – 5 were physically examined and microscopically compared with each other. From these examinations and comparisons, the following conclusions were reached: Based on their observable, physical characteristics, Items 1 – 5 were most consistent with bullets loaded into</p>

TABLE 2

WebCode	Conclusions
	<p>some 9mm Luger caliber cartridges. Matching individual identifying characteristics were found on the three fired bullets submitted as Item 1. It was concluded that the three fired bullets submitted as Item 1 were fired by the same firearm (barrel). Matching individual identifying characteristics were found on Items 1, 3, and 5. It was concluded that Items 1, 3, and 5 were fired by the same firearm (barrel). Matching individual identifying characteristics were found on Items 2 and 4. It was concluded that Items 2 and 4 were fired by the same firearm (barrel), and these Items may be suitable for identification with the firearm (barrel) in which they were fired and/or other fired bullets. Sufficient differences in individual identifying characteristics were found to conclude that Items 2 and 4 were not fired by the firearm (barrel) that fired Items 1, 3, and 5. Items 2 and 4 had been fired through a conventionally rifled barrel with six grooves, right twist. Based on the general rifling characteristics, possible makes and/or origins of 9mm Luger caliber firearms that could have fired Items 2 and 4 include, but may not be limited to, the following: AGRAM, AMERICAN EAGLE, ARCUS, AUSTRALIA, BELGIUM BERETTA BROWNING, CALICO, CARACAL CESKA ZBROJOVKA CHINA (PRC), COLT, CZECHOSLOVAKIA, DAEWOO DIAMONDBACK, EAA CORP., ENGLAND/UK, FEDERAL ENGINEERING, FEG, FM, FMJ (COBRAY), FN/BROWNING, FOX CO. GERMANY, HECKLER &amp; KOCH, HI-POINT FIREARMS, HUNGARY IMI (UZI), INDUSTRIA ARGENTINA, INGRAM (MAC), INTERDYNAMIC, INTRATEC, KAHR ARMS, KELTEC, KSN INDUSTRIES, LUGER, MASTERPIECE ARMS, MAUSER MK ARMS INC., NAVY ARMS, NORINCO PLETTER RADOM, RUGER, SARDIUS SPRINGFIELD INC., STEN, STERLING ARMS, STEYR SWD INC., TANFOGLIO (EAA) TAURUS, TISAS VOLUNTEER/FOLSOM, VULCAN ARMAMENT WALTHER, ZASTAVA. This list is not all-inclusive and is provided for investigative assistance only. If a non-listed firearm is recovered, contact the examiner listed below prior to submitting the firearm for examination.</p>
GVUQ8B	<p>Items 3 and 5 were fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 were not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 are consistent with the 38 caliber family, which includes 9mm Luger. In the event that Items 2 and 4 were fired in a 9mm Luger firearm, then they could have been fired in a firearm of the following manufacture:</p>
GXYJX3	<p>The Item 3 and Item 5 bullets were identified as having been fired from the same firearm that fired the Item 1 bullets (listed as recovered firearm). The Item 2 and Item 4 bullets were identified as having been fired from the same firearm. These bullets were compared to the Item 1, Item 3 and Item 5 bullets with inconclusive results however, differences in individual characteristics indicate a different firearm was used. Manufacturers of firearms with similar rifling characteristics to those displayed by the Item 2 and Item 4 bullets include, but are not limited to Colt, Kel Tec, Ruger, and Taurus. *** This report contains the opinions and interpretations of the individual whose signature appears on the report. All identifications are based on microscopic comparisons and the correspondence of individual characteristics.</p>
H2BTJ7	<p>Items 1, 2, 3, 4, and 5 are of 9 mm/38 caliber. Items 3 and 5 were fired from the same firearm as Item 1. Items 2 and 4 were fired from the same firearm. Items 2 and 4 were not fired from the same firearm as Items 1, 3, and 5.</p>
H68GZD	<p>Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from ammunition designated 9 mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.</p>

TABLE 2

WebCode	Conclusions
H6EKWC	Examinations showed that Item 3 and Item 5 were discharged from the recovered firearm. Examinations showed that Item 2 and Item 4 were not discharged from the recovered firearm.
H9B7NF	The bullets (Items 01-03 and 01-05) are 38/9mm caliber, weigh approximately 115 grains and were fired from the same Ruger pistol that fired the bullets (Item 01-01). The bullets (Items 01-02 and 01-04) were not identified or eliminated as having been fired from the same Ruger pistol that fired the bullets (Item 01-01) due to the agreement of class characteristics, but lack of repeatable individual characteristics; the result is inconclusive. The bullets (Items 01-02 and 01-04) are 38/9mm caliber, weigh approximately 115 and 123 grains and were identified as having been fired from a single unknown firearm having six lands and grooves inclined to the right.
HFCMUE	A. The bullets described in items 1, 3 and 5, are 9mm caliber with right rifling (R-6) and were fired by the same firearm. B. The bullets described in items 2 and 4, are 9mm caliber with right rifling (R-6) and were fired by the same firearm.
HHWGQF	The items 3 and 5 bullets are identified as being fired from the 9mm Luger caliber, Ruger SR9C handgun that the submitted bullets (listed as item 1) were fired from. The items 2 and 4 bullets are identified as being fired from the same unknown firearm; items 2 and 4 are eliminated from being fired from the 9mm Luger caliber, Ruger SR9C handgun that the submitted bullets (listed as item 1) were fired from.
HK4W3R	Bullets (3, 5), compared to test fire bullets (1.1 - 1.3), are identified as having been fired from the above gun based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Bullets (2, 4) are identified as having been fired from a second gun based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
HURNQ6	No doubt that bullets Item 3 and Item 5 are fired in the same pistol as the three bullets from the test-fire. And the bullets Item 2 and Item 4 are fired in a second weapon.
J2C4Y9	The bullets in Items 2, 3, 4, and 5 were microscopically examined in conjunction with Item 1 (known) bullets. Based on these comparative examinations it was determined that: A. The bullets in Items 1 through 5 all bear the same class characteristics. B. Individual characteristics were found on Items 3 and 5 to link them as having been fired through the barrel of the same firearm as Item 1 bullets. C. The bullets in Items 2 and 4 bear no individual characteristics to link them to Items 1,3, and 5 bullets. D. The bullets in Items 2 and 4 bear similar individual characteristics to each other. However, due to the differences in bullet type and lack of a firearm for comparison, a more conclusive examination was not possible.
J8BPL3	Bullet Analysis: Items 1A, 1B, 1C, 2, 3, 4, and 5 are 38 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 1A, 1B, 1C, 2, 3, 4, and 5 are consistent with bullets loaded in 9mm Luger caliber cartridges based upon the weight and style. Items 2 and 4 exhibit characteristics found in (but not limited to) the following firearms: Beretta, Browning, Ceska Zbrojovka, Colt, FN/Browning, Kahr Arms, Keltec, Norinco, Ruger, Springfield Inc., Tanfoglio (EAA), Taurus, and Walther 9mm Luger caliber firearms. Methodology - Comparison Microscopy: Items 3 and 5, the bullets, were fired through the same barrel as Items 1A, 1B, and 1C, based upon corresponding individual microscopic characteristics. Items 2 and 4, the bullets, were not fired through the same barrel as Items 1A, 1B, and 1C, based upon different individual microscopic characteristics. Items 2 and 4, the bullets, were fired through the barrel of the same firearm based upon corresponding individual microscopic characteristics.
JBDDJD	Bullet Evidence: Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from

TABLE 2

WebCode	Conclusions
	ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.
JD6MDE	The Items 01-01, 01-03, and 01-05 copper jacketed bullets were identified as having been fired from the same unknown firearm, which is reportedly a 9mm Luger caliber Ruger pistol, Model SR9C. The Items 01-02 and 01-04 copper jacketed bullets were identified as having been fired from the same unknown firearm. The Items 01-02 and 01-04 copper jacketed bullets were unable to be identified or eliminated as having been fired from the same firearm as the Items 01-01, 01-03, and 01-05 copper jacketed bullets due to a lack of reproducible marks.
JECWFJ	Items 3, Item 5 and item 1 were fired from one firearm. Item 2 and Item 4 were fire from a second firearm.
JEUX7T	Item No.3 and No.5 were fired from the same gun barrel as the known's item No.1. Item No.2 and No.4 were fired from the same gun barrel but not item No.1.
JNGUAE	1. The bullets described in items 1, 3 and 5, are 9mm caliber with right rifling (R-6) and were fired by the same firearm. 2. The bullets described in items 2 and 4, are 9mm caliber with right rifling (R-6) and were fired by the same firearm.
JPF42B	Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.
JVYCJF	The two bullet of Items 3 and 5 had been fired through the barrel of the exhibit Ruger SR9C mm Luger pistol, the bullets of Items 2 and 4, had been fired through the same barrel but not the barrel of the exhibit item 1.
JXNJ4D	Items 2-5 are 38 caliber class bullets (diameter). These items are consistent with being loaded in 9mm Luger caliber cartridges (weight, style, and size). Items 3 and 5 were fired in Item 1 based on corresponding discernible class and individual characteristics. (identification) Items 2 and 4 were fired in the same unknown firearm based on corresponding discernible class and individual characteristics. (identification) Items 2 and 4 could not be identified or eliminated as having been fired in Item 1 due to insufficient corresponding individual characteristics. (inconclusive).
JZXH4D	Items 3 and 5 were microscopically examined and identified as having been fired in the Item 1 firearm based upon the agreement of individual characteristics and all discernible class characteristics. Items 2 and 4 were eliminated as having been fired in the Item 1 firearm due to differences in individual characteristics but were identified as fired in the same firearm.
KDE3VK	Item #2, Item #3, Item #4 and Item #5 fired bullets were microscopically compared with test fired bullets of Item #1. According to the comparison results firearm marks on Item #2, Item #3, Item #4, Item #5 and Item #1 fired bullets were agreed to each other. Hence, Item #2, Item #3, Item #4 and Item #5 fired bullets had been fired from suspected firearm seized by the police (Ruger SR9C 9mm Luger Handgun)
KGYM7F	The Items 1 through 5 fired bullets were examined and microscopically compared to each other with the following results: Items 1, 3 and 5 were identified as having been fired from the same firearm. Items 2 and 4 were eliminated from having been fired from the same firearm as Items 1, 3 and 5 based on differences in individual characteristics. Items 2 and 4 were identified as having been fired from a second unknown firearm.

TABLE 2

WebCode	Conclusions
KJLJCL	Items 2 and 4 were eliminated as being fired in the same firearm as Items 1A, 1B, and 1C based on significant disagreement of individual characteristics within the land impressions. Items 3 and 5 were identified as being fired in the same firearm as Items 1A, 1B, and 1C based on sufficient agreement of individual characteristics within the land impressions. Items 2 and 4 were identified as being fired in a second firearm based on sufficient agreement of individual characteristics within the land impressions.
KJME3J	[No Conclusions Reported.]
KL9623	Exhibits bullets marked 59582/17 3 & 5 were fired from the recovered firearm. Exhibits bullets marked 59582/17 2 & 4 were fired from the same firearm but not the recovered firearm.
KMNHU7	Items 3 and 5 were fired in the same firearm as Item 1 (identification). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 were not fired in the same firearm as Item 1 (elimination). This conclusion was verified by Firearms Examiner (name). Items 2 and 4 were fired in the same firearm (identification). This conclusion was verified by Firearms Examiner (name).
KP98CX	1. Microscopic examination of Exhibits 3 and 5 (bullets) revealed they were fired from the same firearm as the Exhibit 1 test fires. 2. Microscopic examination of Exhibits 2 and 4 (bullets) revealed they were fired from a second firearm.
KQMNHJ	Items 1, 3 and 5 were fired from the same firearm. Items 2 and 4 were not fired from the same firearm as Items 1, 3 and 5. Items 2 and 4 are inconclusive to each other.
KT9H6C	Items 3 and 5 had been fired out of the same barrel than the "known" bullet's. --> same firearm/barrel. Items 2 and 4 had been fired out of an other barrel than the "known" bullet's. --> an other barrel/firearm.
KUNMZ4	Exhibits #3 and #5 were fired from Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as having been fired from Exhibit #1.
KXKFQD	The reference projectiles, specimen #1, were microscopically compared to the copper jacketed projectiles specimens #2 through #5. The following was determined: Specimens #3 & #5 were fired from the same weapon as the reference projectiles, specimen #1. Specimens #2 & #4 were not fired from the same weapon as specimens #1, #3, & #5 due to differences in the individual characteristics; however, they were fired from the same weapon.
KXM2MT	The questioned bullets (Item 3 and Item 5) were fired from the recovered firearm as the known bullets (Item 1). The questioned bullets (Item 2 and Item 4) were not fired from the recovered firearm but fired from the same firearm.
KZUJJ4	Item 3 and item 5 were discharged from the same pistol which discharged item 1 (Ruger SR9C 9mm Luger). Item 2 and item 4 were discharged from a same pistol, different of the pistol which discharged known bullets (item 1).
L4MXN6	Items 2, 3 and 5 were nominal 38 caliber, copper jacketed bullets bearing six lands and grooves inclined to the right. Item 4 was a nominal 38 caliber, copper jacketed hollow point bullet bearing six lands and grooves inclined to the right. The fired bullets collected from the crime scene and the victim, items 2 through 5, were compared to the test-fired bullets from the recovered firearm, item 001, using a comparison microscope. Based on these comparisons, it is the opinion of this examiner that item 3 and item 5 were fired from the recovered firearm. Item 2 and item 4 were also compared to each other using a comparison microscope. Based on these comparisons, it is the opinion of this examiner that item 2 and item 4 were fired from

TABLE 2

WebCode	Conclusions
	the same firearm; however, this firearm is different than the recovered firearm that produced item 1. A list of firearm manufacturers from which items 2 and 4 may have been fired is extensive. Any firearm that is believed to be related to this crime should be submitted to the laboratory for comparison.
L8LDWT	Based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Items 1, 3 and 5, were identified as having been fired from the same firearm. Based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Items 2 and 4, were identified as having been fired from the same firearm. Based on significant disagreement of individual detail, the fired bullets, Items 1, 3 and 5, could not have been fired from the same firearm as the fired bullets, Items 2 and 4.
L92KD4	3. On 2017-11-20 during the performance of my official duties I received a sealed evidence bag with number PA4001476938 from Case Administration of the Ballistics Section, containing the following item: 3.1 One (1) sealed white box with a sticker marked "2017 CTS Forensic Testing Program, Test No. 17-527: FIREARM EXAMINATION, Sample Pack: F2" containing the following items: 3.1.1 Item 1 containing the following: 3.1.1.1 Three (3) 9mm calibre fired bullets each marked "1". 3.1.2 Item 2 containing the following: 3.1.2.1 One (1) 9mm calibre fired bullet marked "2". 3.1.3 Item 3 containing the following: 3.1.3.1 One (1) 9mm calibre fired bullet marked "3". 3.1.4 Item 4 containing the following: 3.1.4.1 One (1) 9mm calibre fired bullet marked "4". 3.1.5 Item 5 containing the following: 3.1.5.1 One (1) 9mm calibre fired bullet marked "5". 4. The intention and scope of this forensic examination comprises of the following: 4.1 The examination and identification of fired bullets. 4.2 Microscopic individualization of fired bullets. 5. I examined the fired bullets mentioned in paragraphs 3.1.1.1, 3.1.2.1, 3.1.3.1, 3.1.4.1 and 3.1.5.1 and compared the individual and class characteristics markings on them using a comparison microscope and found that they were fired from different firearms as follows: 5.1 The bullets mentioned in paragraphs 3.1.1.1, 3.1.3.1 and 3.1.5.1 marked "1", "3" and "5" respectively were fired from a 1st firearm. 5.2 The bullets mentioned in paragraphs 3.1.2.1 and 3.1.4.1 marked "2" and "4" respectively were fired from a 2nd firearm.
LGUTZF	Before the examination, the bullets (Item 1) that were test fired using the suspect handgun were marked V1, V2 and V3. The bullets recovered after a shooting at a residence were marked T1 (Item 2), T2 (Item 3), T3 (Item 4) and T4 (Item 5). The bullets bear appropriate marks that make them suitable for comparative Analysis. Based on these marks the Identification of the suspect firearm appears possible. Comparisons were conducted using the Leica M80 Stereo Microscope, the Leica FSC comparison microscope and the ballistic identification system "balscan" to identify similarities in striated Marks. Based upon the observed similarities of individual characteristics (striated Marks) is concluded the bullets T2 and T4 (compared to V1, V2 and V3) were fired from the suspect's firearm.
LHP43A	The three (3) bullets (Item 1) were reported as being fired from the suspect's firearm. The suspect's firearm was reported as being a 9mm Luger caliber Ruger model SR9C pistol. The two (2) bullets (Items 3 and 5) were microscopically compared to the three (3) bullets (Item 1) with POSITIVE RESULTS. The two (2) Items 3 and 5 bullets were fired through the same firearm barrel as the three (3) Item 1 bullets. The two (2) bullets (Items 2 and 4) were microscopically compared to each other with POSITIVE RESULTS. The two (2) Items 2 and 4 bullets were fired through the same firearm barrel. The two (2) bullets (Items 2 and 4) were microscopically compared to the three (3) bullets (Item 1) with INCONCLUSIVE RESULTS. Due to insufficient agreement or disagreement of individual characteristics, the two (2) Items 2 and 4 bullets could neither be identified nor eliminated as having been fired through the same firearm barrel as the three (3) Item 1 bullets.

TABLE 2

WebCode	Conclusions
LMGHH4	<p>3. On 2017-11-20 during the performance of my official duties I received a sealed evidence bag with number PA4001476937 from Case Administration of the Ballistics Section, containing the following items: 3.1 One (1) jewel box marked "Item 1" containing the following exhibits: 3.1.1 Three (3) 9mm calibre fired bullets marked by me "535383/17" each and "T1A", "T1B" and "T1C" respectively. 3.2 One (1) jewel box marked "Item 2" containing the following exhibit: 3.2.1 One (1) 9mm calibre fired bullet marked by me "535383/17 2". 3.3 One (1) jewel box marked "Item 3" containing the following exhibit: 3.3.1 One (1) 9mm calibre fired bullet marked by me "535383/17 3". 3.4 One (1) jewel box marked "Item 4" containing the following exhibit: 3.4.1 One (1) 9mm calibre fired bullet marked by me "535383/17 4". 3.5 One (1) jewel box marked "Item 5" containing the following exhibit: 3.5.1 One (1) 9mm calibre fired bullet marked by me "535383/17 5". 4. The intention and scope of this forensic examination comprise of the following: 4.1 The examination and identification of fired bullets. 4.2 Microscopic individualization of fired bullets. 5. I examined the fired bullets mentioned in paragraphs 3.1.1, 3.2.1, 3.3.1, 3.4.1 and 3.5.1 and compared the individual and class characteristics markings on them using a comparison microscope and found: 5.1 The bullets mentioned in paragraphs 3.1.1, 3.3.1 and 3.5.1 were fired from the same (1st) firearm. 5.2 The bullets mentioned in paragraphs 3.2.1 and 3.4.1 were fired from a second (2nd) firearm.</p>
LMV7HA	<p>Item 3 and Item 5 of recovered questioned bullets were fired in the same firearm (Ruger SR9C 9mm Luger handgun) as the known bullets (Item 1), whereas Item 2 and Item 4 of recovered questioned bullets were fired from another firearm.</p>
LTPYXK	<p>The bullets identified as item 3 and item 5 were fired by the same weapon that fired the bullets identified as item 1.</p>
LUZWAF	<p>Item 1 - Three (3) 9mm Luger caliber fired bullets [samples from Ruger pistol] (1). Item 2 - One (1) fired bullet (2). Item 3 - One (1) fired bullet (3). Item 4 - One (1) fired bullet (4). Item 5 - One (1) fired bullet (5). The submitted specimens marked Item 2, 3, 4, and 5 were examined and identified as four (4) fired 9mm Luger caliber jacketed bullets exhibiting six (6) land and groove impressions with a right twist. Items 2 through 5 were microscopically inter-compared and compared to Item 1 sample bullets. As a result of microscopic examination, it was concluded that Items 3 and 5 were identified as having been fired from the same firearm that fired Item 1 sample bullets. Items 2 and 4 were eliminated as having been fired from the same firearm that fired Item 1 sample bullets due to differences in individual characteristics. Items 2 and 4 were identified as having been fired from the same unknown firearm. Firearms that produce similar rifling characteristics as those exhibited on Items 2 and 4 include, but are not limited to: 9mm Luger caliber semi-automatic pistols marketed by: Beretta, Czechoslovakia, FEG, FN/Browning, Heckler &amp; Koch, Kel-Tec, Luger, Radom, Ruger, Tanfoglio, Taurus, Walther, and Zastava.</p>
LWKX43	<p>After microscopic examination the bullet exhibits marked 531660/17 A3 and A5 were positive with test bullets marked 660TB1A1-TB1C1 (Item 1) - land and grooves corresponds. Fired bullets marked 531660/17 A2 (Item 2) and 531660/17 A4 (Item 4) are negative with test bullet 660TB1A1 - TB1C1 different individual characteristics.</p>
LZNJZF	<p>Item 3 and 5 bullets were fired from the same firearm as the item 1 bullets. Item 2 and 4 bullets were different from the firearm used to fire item 1 bullets.</p>
M8JTZC	<p>The four submitted as items 2, 3, 4 and 5 were microscopically compared to each other and to the said test fired bullets submitted as item 1 (Three bullets discharged from the suspect's weapon) and it was determined that: All the bullets have six (6) land and six (6) Groove with right rotation. Two (2) of the bullets (Items 3 and 5) were identified as having been fired in the</p>

TABLE 2

WebCode	Conclusions
	suspect's firearm (item 1). Two (2) of the bullets (Items 2 and 4) had been fired through the same barrel by using a second firearm.
ME7NR9	On items 3 and 5 class characteristics and individual characteristics match with the items 1. Items 3 and 5 have been fired with the same firearm as items 1. On items 2 and 4 individual characteristics does not match with the items 1.
MELYGZ	(1) The fired bullets marked 5311617/17 D3 & D5 were fired from the same firearm as bullets fired in the recovered firearm marked 617TB1A-617TB1C - grooves and land marks correspond. The fired bullets marked 531617/17D2 & D4 were fired from the same firearm - second firearm (unknown).
MFH9UQ	AS A RESULT OF A MICROSCOPIC COMPARISON THE FOLLOWING WAS DETERMINED:- THERE WAS SUFFICIENT FIRING DETAIL PRESENT, CONSISTING OF RIFLING DETAIL AND FINE DETAIL WITHIN TO INDICATE THAT BULLETS 3 AND 5 WERE FIRED IN THE SAME GUN AS BULLETS 1. THERE WAS SUFFICIENT FIRING DETAIL , CONSISTING OF RIFLING DETAIL AND FINE DETAIL WITHIN TO INDICATE THAT BULLETS 2 AND 4 WERE FIRED IN THE SAME GUN BUT DIFFERENT GUN UTILISED TO DISCHARGE BULLETS 1,3 AND 5.
MG8U7E	Item 1 - Three (3) bullets test fired using the recovered firearm (known). Item 2 - One (1) fired bullet. Item 3 - One (1) fired bullet. Item 4 - One (1) fired bullet. Item 5 - One (1) fired bullet. The submitted specimens marked as Items 2 through 5 were examined and identified as four (4) fired 9mm Luger caliber bullets exhibiting six (6) land and groove impressions with a right twist. Items 2 through 5 were microscopically inter-compared and compared to Item 1. As a result of microscopic comparisons, Items 3 and 5 were identified as having been fired in the same firearm as Item 1. Items 2 and 4 were identified as having been fired in the same firearm but inconclusive as to having been fired in the same firearm as Items 1, 3, and 5 due to the lack of agreement of individual characteristics.
MJRV2Z	Bullets marked Item 3 and Item 5 were fired from the same firearm as the tests marked Item 1. Bullets marked Item 2 and Item 4 were fired from a second (unknown) firearm.
MJYTKD	Items 3 and 5 were identified microscopically as having been fired from the same firearm as Item 1 based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were identified microscopically as having been fired from the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were eliminated as having been fired from the same firearm as Item 1 due to disagreement of individual characteristics.
MKN4DQ	Item1(test fired bullets), 2, 3, 4 and 5 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, only Item3 and 5 were identified as having been fired in the handgun seized from the suspect's residence.
MMURQV	Item 1 contains three bullets that were previously test fired from a 9mm Luger (9x19mm) Ruger pistol, Model SR9C. Item 3 and Item 5 are .38 caliber/9mm copper jacketed round nose bullets that were identified as having been fired from the barrel of Item 1. Item 2 is a .38 caliber/9mm copper jacketed round nose bullet. Item 4 is a .38 caliber/9mm copper jacketed hollow point bullet that is physically consistent in design and weight to bullets loaded in Federal 9mm Luger Hydra-Shok® cartridges. The Item 2 and Item 4 bullets were identified as having been fired from the same barrel. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 2 and Item 4 bullets were fired from the barrel of Item 1. A check of the general rifling characteristic (GRC)

TABLE 2

WebCode	Conclusions
	database produced a voluminous list of firearmss with GRCs like those present on the Item 2 and Item 4 bullets that includes pistols marketed by Hi-Point, Ruger and Taurus.
MT4LA8	The fired bullets in Items 2, 3, 4 and 5 (questioned) were examined and microscopically compared to the fired bullets in Item 1 (known). It was determined that the fired bullets in Items 3 and 5 were fired in the same firearm as the fired bullets in Item 1. It was also determined that the fired bullets in Items 2 and 4 were fired in a different firearm than the fired bullets in Item 1.
MT4MV6	A microscopic examination and comparison of items #3 and #5 to test expended bullets fired from item #1, a 9mm Ruger Pistol, model SR9C displayed sufficient agreement of individual characteristics to conclude that items #3 and #5 were both fired from the Ruger pistol, item #1. Items #2 and #4 displayed sufficient agreement of individual characteristics to conclude they were both fired from one other unknown gun.
MVNR89	The second bullet recovered from the wall at the scene (identified as Item 3) and the bullet recovered from the ceiling at the scene (identified as Item 5) were fire by the Ruger SR9C 9mm Luger handgun recovered from suspect residence. The first bullet recovered the wall at the scene (identified as Item 2) and the bullet recovered from the victim (identified as Item 4) were not fire by the Ruger SR9C 9mm Luger handgun recovered from suspect residence.
MW29FF	Item 3 and item 5 are fired from same firearm as item 1. Item 2 and item 4 fired from second firearm.
MYBEZW	Item 3(QB-2) and item 5 (QB-4) bear marks consistent with having been fired from item1 (K-1). Item 2 (QB-1) and item 4 (QB-3) bear marks consistent with having been fired from the same firearm. That firearm cannot be identified or eliminated as having been item 1 (K-1).
N6RDN8	Items 2-5 are 38 caliber class bullets (diameter). These items are consistent with being loaded in 9mm Luger caliber cartridges (weight, style, and size). Items 3 and 5 were fired in Item 1 based on corresponding discernible class and individual characteristics. (identification) Items 2 and 4 were fired in the same unknown firearm based on corresponding discernible class and individual characteristics. (identification) Items 2 and 4 could not be identified or eliminated as having been fired in Item 1 due to insufficient corresponding individual characteristics. (inconclusive).
N6XEZA	Five of the bullets (1A - 1C, 3, 5) were fired from the same firearm. Two of the bullets (2, 4) were fired from the same firearm. Two of the bullets (2, 4) were not fired from the same firearm as were the other five bullets (1A - 1C, 3, 5.)
N9U3GG	[No Conclusions Reported.]
NFVG2H	Item 1 - Three spent 9 mm caliber copper jacketed bullets reportedly discharged from a 9 mm caliber Ruger model SR9C pistol. The bullets described above had weights of 114.9, 115.3 and 115.0 grains and a classification of six lands and grooves with a right-hand twist. The bullets matched each other and were reportedly discharged from the above Ruger pistol. The identifications were based on the agreement of individual characteristics observed during the microscopic comparison. Item 2 - One spent 9 mm caliber copper jacketed bullet. Item 4 - One spent 9 mm caliber copper jacketed hollow-point bullet. The bullets described above had weights of 115.0 and 123.8 grains and a classification of six lands and grooves with a right-hand twist. The bullets matched each other and were discharged from the same firearm. The identifications were based on the agreement of individual characteristics observed during a microscopic comparison. The bullets were also compared to the Item 1 bullets. The bullets were eliminated as having been discharged from the Ruger pistol based on differences in their

TABLE 2

WebCode	Conclusions
	individual characteristics observed during a microscopic comparison. Item 3 - One spent 9 mm caliber copper jacketed bullet. Item 5 - One spent 9 mm caliber copper jacketed bullet. The bullets described above had weights of 115.1 and 115.0 grains and a classification of six lands and grooves with a right-hand twist. The bullets matched the Item 1 bullets and were discharged from the above Ruger pistol. The identifications were based on the agreement of individual characteristics observed during a microscopic comparison.
NN7T73	2.1 Item 1, 3 and 5 were fired from the same firearm. 2.2 Item 2 and 4 were fired from the same firearm but negative to the firearm mentioned in 2.1
NP22MY	Bullet Analysis: Items 1A, 1B, 1C, 2, 3, 4 and 5 are 38 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 1A, 1B, 1C, 2, 3, 4 and 5 are consistent with bullets loaded in 9mm Luger caliber cartridges based upon the weight and style. Items 2 and 4 exhibit characteristics found in (but not limited to) the following firearms: American Eagle, Beretta, Browning, EAA Corp, FMJ (Cobray), FN/Browning, Heckler and Koch, Kahr Arms, Keltec, Norinco, Ruger, Springfield, Inc, Steyr, SWD, Inc, Tanfoglio, Taurus and Walther 9mm Luger caliber firearms. Methodology - Comparison Microscopy: Items 3 and 5, the bullets, were fired through the same barrel as Items 1A, 1B and 1C, based upon corresponding individual microscopic characteristics. Items 2 and 4, the bullets, were not fired through the same barrel as Items 1A, 1B and 1C, based upon different individual microscopic characteristics. Items 2 and 4, the bullets, were fired through the barrel of the same firearm based upon corresponding individual microscopic characteristics.
NP32JT	Items #3 and #5 were both fired from firearm #1 based on the agreement of class characteristics and patterns of sufficient corresponding individual characteristics. Items #2 and #4 were not fired from firearm #1 based on the disagreement of the individual characteristics.
NPZGMC	Items #2, #3, #4 and #5 are bullets fired from a firearm barrel rifled with six lands and grooves, right twist, and are all consistent being 9mm Luger caliber. A request was made for these bullets to be compared to test fires from a known firearm. Items #3 and #5 were identified as having been fired from the known firearm, while items #2 and #4 were eliminated from being fired from the known firearm.
NQDYUP	The Exhibit #3 and #5 bullets were fired from the same firearm as the Exhibit #1 bullets. The Exhibit #2 and #4 bullets were fired from the same firearm. They were not fired from the same firearm as the Exhibit #1, #3 and #5 bullets. The Exhibit #2 and #4 bullets have design features consistent with bullets loaded in 9mm Luger caliber cartridges. There are numerous manufacturers of firearms with similar rifling characteristics.
NXULHY	Questioned bullets marked item 3 & 5 were fired from the recovered firearm. Questioned bullets marked item 2 & 4 were fired from a second firearm.
NYQUVP	Items 3 and 5 bullets were fired by the firearm that fired Item 1 test-fires. Items 2 and 4 bullets were fired by one firearm. These bullets are consistent with bullets commonly found loaded in some 9mm Luger caliber cartridges. Item 4 is consistent with bullets found loaded in Federal Hydra-Shok ammunition. Items 2 and 4 bullets were not fired by the firearm that fired Item 1 test-fires. See the attachment for a list of possible firearm manufacturers/origins that may have fired these projectiles. Note that this list may not be all inclusive. [Attachment not provided by participant].
PA2PMT	Item 1 is three bullets identified to have been test fired from a Ruger 9mm Luger (9x19mm) pistol, Model SR9C. Item 2, Item 3, Item 4, and Item 5 are .38 caliber bullets that were fired from a barrel rifled with six grooves, right twist. Items 2, 3, and 5 are full metal jacket bullets consistent in weight and design with bullets loaded in 9mm Luger cartridges. Item 4 is a

## TABLE 2

WebCode	Conclusions
	<p>jacketed hollow point consistent in weight and design with bullets loaded in Federal Hydra-Shok 9mm Luger cartridges. The Item 1, Item 3, and Item 5 bullets were identified as having been fired from the barrel of the same firearm. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 2 or Item 4 bullets were fired from the barrel of the same firearm as Item 1, Item 3, and Item 5 bullets. The Item 2 and Item 4 bullets were identified as having been fired from the barrel of the same firearm. A check of the Laboratory's General Rifling Characteristics (GRC) database produced a list of firearms with GRCs like those present on the Item 2 and Item 4 bullets that include pistols marketed by Beretta, Browning, CZ, FN, Ruger, and Walther.</p>
PEEMTV	<p>The below listed spent bullets were microscopically examined and compared with test bullets fired from the Ruger 9mm luger pistol. Numerous corresponding individual characteristics were observed. Therefore, it is my opinion that the below listed items were fired from this firearm. Lab Evidence # Property # Item# Item Description 001-A3 PEEMTV 3 Spent 38 caliber bullet 001-A5 PEEMTV 5 Spent 38 caliber bullet The below listed spent bullets were microscopically examined and compared with test bullets fired from the Ruger 9mm luger pistol. It is my opinion that these items were not fired from this firearm. The below listed spent bullets were further microscopically examined and compared with each other. Numerous corresponding individual characteristics were observed. Therefore, it is my opinion that the below listed items were fired from the same firearm. This firearm has a barrel with 6 lands and grooves with a right twist. Lab Evidence # Property # Item# Item Description 001-A2 PEEMTV 2 Spent 38 caliber bullet 001-A4 PEEMTV 4 Spent 38 caliber bullet The evidence will be returned to Firearms Evidence Storage. [Participant submitted data in a format that could not be reproduced in this report].</p>
PHVMGN	<p>PROJECTILE B (ITEM 3) AND PROJECTILE D (ITEM 5) WERE FIRED IN THE SAME 9MM PISTOL THAT PRODUCED THE SUBMITTED TEST FIRED PROJECTILES (ITEM 1). PROJECTILE A (ITEM 2) AND PROJECTILE C (ITEM 4) WERE FIRED IN A SECOND 9MM WEAPON. THE SPECIFIC BRAND OF SUSPECT WEAPON IS UNKNOWN; HOWEVER, ANY SUSPECT WEAPON SHOULD BE SUBMITTED FOR EXAMINATION.</p>
PLV7AA	<p>Considering the comparison of their characteristics, the recovered bullets from Item 3 and Item 5 were fired in the recovered firearm (Item 1). The bullets from Item 3 and Item 5 present same characteristics than the bullets fired using the recovered firearm (Item 1). Otherwise the recovered bullets from Item 2 and Item 4 were fired by a same firearm which is different from Item 1.</p>
PLWX7W	<p>Item 1, Item 3, and Item 5 were all fired from the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics within the land impressions. Item 2 and Item 4 were fired from the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics within the land impressions. Item 1, Item 3, and Item 5 were not fired from the same firearm as Item 2 and Item 4 based on agreement of class characteristics but significant disagreement of individual characteristics within the land impressions.</p>
PTE9HC	<p>The Items 2 through 5 fired 9mm bullets and the Item 1 test fired bullets were examined and microscopically compared to each other. The results are as follows: The Items 3 and 5 were identified as to having been fired in the same firearm as the Item 1 test fires. Items 2 and 4 were identified to each other as to having been fired in the same firearm, but were eliminated from the Item 1 test fires. Some possible firearms that exhibit the same class characteristics as observed on Items 2 and 4 and that are commonly encountered include, but are not limited to, those marketed by: Beretta, Browning, CZ, FN, H&amp;K, Kel-Tec, Luger, Mauser, Norinco, Radom, Ruger, Springfield, Tanfoglio, and Wather.</p>

TABLE 2

WebCode	Conclusions
PV3VX7	The projectiles in Items 3 and 5 were fired in the same gun that fired the projectiles in Item 1. The projectiles in Items 2 and 4 bear class characteristics consistent with those produced by the gun that fired the projectiles in Item 1. The projectiles in Items 2 and 4 bear no significant similarities in individual characteristics with those produced by the gun that fired the projectiles in Item 1.
PZB4FA	The examination of the recovered questioned bullets under a comparison microscope allows us to conclude that the bullets "item 3" and "item 5" were fired from the RUGER SR9C 9mm seized from the suspect's residence. The examination also showed that "item 2" and "item 4" were not fired from the seized weapon, but both from a second firearm.
Q29RH7	The bullets, (items 1, 3 and 5) were identified as having been fired from the same firearm. The bullets, (items 2 and 4) were identified as having been fired from a second firearm.
Q3CQ86	Items 3 and 5 were fired in the same firearm as the item 1 test fires. Items 2 and 4 were fired in a second firearm. Items 2 and 4 are consistent with bullets from ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.
Q67C2W	The fired bullets in Exhibits #3 and #5 were fired from the firearm in Exhibit #1. The fired bullets in Exhibits #2 and #4 were fired from the same firearm. The fired bullets in Exhibits #2 and #4 could not be identified or eliminated as having been fired from the firearm in Exhibit #1.
QBUZV2	Examination of Items 2, 3, 4 and 5 revealed them to be .38 caliber class bullets consistent with those commonly loaded in 9mm Luger caliber ammunition. These bullets have been fired from a firearm rifled with six lands and grooves, right twist. Based on the agreement of class characteristics, Items 3 and 5, were microscopically compared to the Item 1 test exemplars. These two bullets were identified on individual characteristics as having been fired by the recovered Ruger pistol. The significance of these identifications is made to the practical, not absolute, exclusion of all other firearms. Based on the agreement of class characteristics, Items 2 and 4, were microscopically compared to each other as well as to the Item 1 test exemplars. Items 2 and 4 were identified on individual characteristics as having been fired by the same firearm. Items 2 and 4 could neither be identified to, nor eliminated from, having been fired from the recovered Ruger pistol based on insufficient agreement or disagreement of individual characteristics. Therefore, any additional firearms recovered during the course of this investigation should be submitted along with Items 2 and 4 for comparison purposes.
QETDG7	Items 1B through 1E (item 2-5) are projectiles that based on size, weight and configuration are consistent with projectiles loaded in 9mm Luger cartridges. Items 1C (item 3) and 1E (item 5) were identified as having been fired from item 1A (item 1) based on the agreement of class and individual characteristics. Items 1B and 1D were eliminated as having been fired from item 1A based on the disagreement of individual characteristics.
QFMYAW	Exhibits #3 and #5 were fired from the firearm in Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as having been fired from the same firearm as Exhibits #3 and #5 or the firearm in Exhibit #1.
QKJQG9	The bullets from Items 3 and 5 have been fired in the same weapon as those from Item 1. The bullets from Items 2 and 4 have been fired in another single firearm, bearing the same class characteristics than the recovered gun, but different individual characteristics.
QLQ3ZV	a) The two bullets in "Item 3" and "Item 5" were fired from the firearm that fired the three bullets in "Item 1". b) The two bullets in "Item 2" and "Item 4" were not fired from the firearm that fired

TABLE 2

WebCode	Conclusions
	the three bullets in "Item 1".
QPPEXG	The bullets submitted above as Items 1, 2, 3, 4, and 5 were evaluated and were all determined to be consistent with nominal caliber 38 bullets bearing six land impressions and six groove impressions with a right hand twist. The bullets submitted above as Items 1, 2, 3, 4, and 5 were microscopically compared to one another. The comparisons disclosed that Items 1, 3, and 5 were all fired by the same firearm. Items 2 and 4 were identified as having been fired by a second unknown firearm. The list of manufacturers of firearms with general rifling characteristics similar to those observed on Items 2 and 4 is extensive and therefore, any firearm with suspected involvement in this case should be forwarded to the laboratory for evaluation.
QQQAME	[No Conclusions Reported.]
QVFRXJ	Deformed bullets (Item #'s 3, 5) and Test fires (Item #'s 1.1 - 1.3) are identified as having been discharged from the SAME firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics. Deformed bullets (Item #'s 2, 4) are identified as having been discharged from a SECOND firearm based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
R6YKN7	A. The bullets described in items 1, 3 and 5, are 9mm caliber with right rifling (R-6) and were fired by the same firearm. B. The bullets described in items 2 and 4, are 9mm caliber with right rifling (R-6) and were fired by the same firearm.
R84DH6	The questioned bullets named Item 2 and item 4 were not fired in the same firearm ("Ruger SR9C 9mm Luger, handgun") as the known bullets (Item 1). The questioned bullets named Item 3 and item 5 were fired in the same firearm ("Ruger SR9C 9mm Luger, handgun") as the known bullets (Item 1).
RCGXM6	The projectiles in Items 3 and 5 were fired in the same gun that fired the projectiles in Item 1. The projectiles in Items 2 and 4 bear class characteristics consistent with the projectiles in Item 1. However, no significant similarities in individual characteristics were observed.
RP7VTA	On the examination and comparison, I found: i) Sufficient characteristic marks on the test fired bullets Item 1, Item 3 and Item 5 for a positive correlation. Hence, I am of the opinion that the same firearms fired the expanded bullet in Item 1, Item 2 and Item 3. ii) Item 2 are fired different firearms. iii) Item 4 are unable to compared because the expanded bullet are damaged.
T3AJGW	(1) The Items 1, 3 and 5 bullets were identified as having been fired from the same firearm. (2) The Items 2 and 4 bullets were identified as having been fired from the same firearm. However, the bullets were not fired from the same firearm as items 1, 3 and 5.
T3RK6K	The Exhibit #1, #3, and #5 bullets were fired from the same firearm. The Exhibit #2 and #4 bullets were fired from the same firearm. They were not fired from the same firearm as the Exhibit #1, #3, and #5 bullets. The Exhibit #2 and #4 bullets are 38 caliber class (38/357/9mm) and display rifling characteristics similar to firearms by numerous manufacturers.
TBKX3Y	Items 3 and 5 were identified as having been fired in the Ruger SR9C pistol associated with Item 1. The identifications were confirmed by another qualified examiner. Item 2 has class characteristics consistent with the bullets from Item 1. Differences were noted between the individual characteristics of Item 2 and the bullets from Item 1. However, without access to the associated firearm or additional exemplars, Item 2 was not conclusively eliminated from having

TABLE 2

WebCode	Conclusions
	<p>been fired in the Ruger SR9C pistol associated with Item 1. Item 4 has class characteristics consistent with the bullets from Item 1. Differences were noted between the individual characteristics of Item 4 and the bullets from Item 1. However, without access to the associated firearm or additional exemplars, Item 4 was not conclusively eliminated from having been fired in the Ruger SR9C pistol associated with Item 1. Items 2 and 4 have class characteristics consistent with each other. Some agreement was noted in the gross characteristics of Items 2 and 4. However, due to the nature of the marks and the potential for subclass influence, Items 2 and 4 were neither identified to or eliminated from having been fired in the same firearm as each other.</p>
TEMX3V	<p>Bullets marked 3 and 5 were fired from the same firearm that discharged bullets marked 1 (tests). Bullets marked 2 and 4 were fired from the same firearm but NOT in the firearm that discharged the bullets marked 1 (tests).</p>
TFFPE3	<p>1. Examinations showed that Item 3 (D-2) and Item 5 (D-4), were discharged from the Ruger SR9C, 9mm Luger handgun. 2. Examinations showed that Item 2 (D-1) and Item 4 (D-3), were not discharged from the Ruger SR9C, 9mm Luger handgun.</p>
TH39CT	<p>Exhibits #3 and #5 were fired from the same firearm that fired the known samples in Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as having been fired from the same firearm that fired the known samples in Exhibit #1.</p>
TME9FC	<p>The fired bullets, Lab Items 3 &amp; 5, were fired from the Ruger firearm based on microscopic comparison to the test fires, Lab Item 1, and agreement of discernible class characteristics and sufficient matching individual detail. The fired bullets, Lab Items 2 &amp; 4, were not fired from the Ruger firearm based on microscopic comparison to the test fires, Lab Item 1, and significant disagreement of individual characteristics. The fired bullets, Lab Items 2 &amp; 4, were fired from the same unknown firearm based on microscopic comparison and agreement of discernible class characteristics and sufficient matching individual detail.</p>
TRTW8W	<p>The bullets marked 1, 3 and 5 were fired in the recovered firearm (know). The bullets marked 2 and 4 were fired in a second, unknown firearm.</p>
TWLU3E	<p>Item 1 - Three 9 mm caliber test bullets discharged from known Ruger pistol. Item 2 - One spent 9 mm caliber copper jacketed bullet reportedly recovered from the wall at scene. Item 4 - One spent 9 mm caliber copper jacketed hollow point bullet reportedly removed from the victim. The bullets described above (Item 2 and 4) had weights of 115.4 grains and 122.9 grains respectively, and a classification of six lands and grooves with a right-hand twist. The bullets matched each other and were discharged from the same firearm. The identification was based on the agreement of individual characteristics observed during a microscopic comparison. The bullets were also compared to the Item #1 test bullets discharged from the known Ruger pistol. The bullets were eliminated as having been discharged from the Ruger pistol based on differences in their individual characteristics observed during a microscopic comparison. Item 3 - One spent 9 mm caliber copper jacketed bullet reportedly recovered from the wall at scene. Item 5 - One spent 9 mm caliber copper jacketed bullet reportedly collected from the ceiling at the scene. The bullets described above had weights of 114.8 grains and 115.7 grains respectively, and a classification of six lands and grooves with a right-hand twist. Both bullets matched the Item #1 test bullets and were discharged from the known Ruger pistol. The identifications were based on the agreement of individual characteristics observed during a microscopic comparison.</p>
UBYNM3	<p>Comparative examinations of Item 3 (bullet) and Item 5 (bullet) against Item 1 (test fired bullets said to be from a Ruger SR9C 9mm Luger caliber firearm) showed the presence of matching</p>

TABLE 2

WebCode	Conclusions
	features. This means that Items 3 and 5 were fired in Item 1. Comparative examinations of Item 2 (bullet) and Item 4 (bullet) showed the presence of matching features. This means that Items 2 and 4 were fired in the same firearm. It could not be determined if Item 1 fired Items 2 and 4. The comparative examinations showed no individual characteristics, but, are insufficient for an elimination. Without ability to obtain additional test fires, the comparative examination of Item 1 to Items 2 and 4 is Inconclusive.
ULFF87	The fired bullets submitted as Items 2, 3, 4, and 5 were microscopically compared to each other and to the said test fired bullets submitted as Item 1 and it was determined that: The two bullets submitted as Items 3 and 5 were fired from the same firearm that fired the bullets submitted as Item 1. The fired bullets submitted as Items 2 and 4 were fired the others firearms but not from the firearm that fired Item 1.
URL6U7	Questioned bullets, Items 3 and 5 were fired in the same firearm as the known fired bullets, Item 1.
V3JHAW	Item: 1 Three bullets fired using the recovered firearm (known). RESULTS: The Item 1 fired bullets were physically examined and microscopically compared with each other. Matching individual identifying characteristics were found, and it was concluded that the Item 1 bullets were all fired by one firearm. Item: 2 First bullet recovered from the wall at the scene (questioned). Item: 3 Second bullet recovered from the wall at the scene (questioned). Item: 4 Bullet recovered from victim (questioned). Item: 5 Bullet recovered from the ceiling at the scene (questioned). RESULTS: Items 2 – 5 were physically examined and microscopically compared with each other and with the Item 1 fired bullets with the following results: Matching individual identifying characteristics were found, and it was concluded that Items 3 and 5 were fired by the same firearm that fired the Item 1 bullets. Matching individual identifying characteristics were found, and it was concluded that Items 2 and 4 were fired by a second firearm. Sufficient differences in the individual identifying characteristics in the rifling impressions were found to conclude that Items 2 and 4 were not fired by the firearm that fired the Item 1, 3, and 5 fired bullets. Physical and microscopic examinations of Items 2 and 4 revealed that they were most consistent with bullets loaded into some 9mm Luger caliber cartridges. Marks of value were found, and it was concluded that Items 2 and 4 may be suitable for identification with a specific firearm (barrel) and/or another fired bullet(s). Items 2 and 4 had been fired through a conventionally rifled barrel with six grooves, right twist. Based on the general rifling characteristics, the list of possible makes and/or origins of firearms in 9mm Luger caliber that could have fired Items 2 and 4 was extensive and will not be included in this report. Please contact the examiner listed below, prior to submission of a firearm for comparison.
V66B3Q	Items #3 and #5 were fired from the same firearm as Item #1. Items #2 and #4 were fired from the same firearm. Items #2 and #4 could not be identified or eliminated as having been fired from the same firearm as Items #1, #3, or #5.
V8D73W	Items 3 and item 5 were fired in the same firearm as item1. Item 2 and item 4 were fired in the second firearm
V8YPXW	Items 3 and 5 were fired in the same firearm as Item 1. Items 2 and 4 were fired in the same firearm. Items 2 and 4 could not be identified or eliminated as having been fired in the firearm that fired Item 1.
VAPY4Q	Bullet Analysis: Items 2, 3, and 5 are 38 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 2, 3, and 5 are consistent with bullets loaded in 9mm Luger caliber cartridges bases upon the weight and style. Item 4 is a 38 caliber class bullet bases upon the diameter. Opinion/Interpretation: Items 4 is consistent with bullets loaded in 9mm Luger, .357 Magnum, and .38 Special caliber cartridges bases upon the weight and style.

## TABLE 2

WebCode	Conclusions
	Methodology- Comparison Microscopy: Items 3 and 5, the bullets, were fired through same barrel as Items 1A, 1B , and 1C , the test fired bullets from 9mm Luger Ruger handgun, based upon corresponding class and individual microscopic characteristics. Items 2 and 4, the bullets, were not fired through same barrel as Items 1A, 1B , and 1C , the test fired bullets from 9mm Luger Ruger handgun, based upon different individual microscopic characteristics. Comparisons between Items 2 and 4, the bullets, were inconclusive due to insufficient corresponding individual microscopic characteristics.
VBVJP7	In my opinion, a microscopical comparison of Item 1 against Items 2, 3, 4 & 5 has shown there is sufficient agreement of class and individual characteristic markings to conclusively determine that Items 3 and 5 were fired in the same firearm. (Gun 1). In my opinion, a microscopical comparison of firing marks has shown there is sufficient disagreement of class and individual characteristic markings to conclusively determine that items 2 and 4 were not fired in the firearm Item 1. (Gun 2)
VCA63E	The two bullets marked #2 and #4 were negative to the test bullets marked #1. The two bullets marked #2 and #4 were Positive (identified) to each other and as having been discharged in the same unknown firearm. The two bullets marked #3 and #5 were Positive (identified) to the test bullets marked #1. They were discharged from the same firearm.
VEEFDW	MICROSCOPIC COMPARISON EXAMINATIONS OF EVIDENCE CALIBER 9MM BULLETS Q1B THROUGH Q4B AND THE TEST FIRED BULLETS REVEALED; SUFFICIENT AGREEMENT OF INDIVIDUAL CHARACTERISTICS EXISTS TO IDENTIFY Q2B AND Q4B AS HAVING BEEN FIRED WITH THE SAME FIREARM AS THE TEST FIRED BULLETS. Q1B WAS NOT FIRED WITH THE SAME FIREARM AS Q2B, Q4B OR THE TEST FIRED BULLETS DUE TO DIFFERENT INDIVIDUAL CHARACTERISTICS. Q3B WAS NOT FIRED WITH THE SAME FIREARM AS Q1B, Q2B, Q4B OR THE TEST FIRED BULLETS DUE TO THE LAND AND GROOVES ON Q3B BEING DIFFERENT WIDTHS THAN THOSE OF Q1B, Q2B, Q4B AND THE TEST FIRED BULLETS. SHOULD SUSPECT FIREARMS BECOME AVAILABLE PLEASE SUBMIT. SUFFICIENT AGREEMENT: Sufficient agreement is related to the significant duplication of random toolmarks as evidence by a pattern or combination of patterns of surface contours. "Sufficient agreement" exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.
VHEKAP	The items 3 and 5 bullets are identified as having been fired from the same firearm that fired the item 1 bullets, based on the correspondence of the individual characteristics. The items 2 and 4 bullets were microscopically compared to the items 1, 3, and 5 bullets with inconclusive results however, differences indicate a different firearm was used. The items 2 and 4 bullets were identified as having been fired from the same unknown firearm based on the correspondence of the individual characteristics. Manufacturers/brands of firearms that could have fired these bullets include, but are not limited to Beretta, Colt, Heckler & Koch, Keltec, Ruger, Taurus, and Walther.
VJQGGE	The two(2) bullets marked #2 and #4 were negative to the test bullets marked #1. The two(2) bullets marked #2 and #4 were Positive (Identified) to each other and as having been discharged in the same unknown firearm. The two (2) bullets marked #3 and #5 were Positive (Identified) to the test bullets marked #1. They were discharged from the same firearm.
VLC7Y7	Items 3 and 5 are consistent in weight and style with item 1. They exhibit sufficient individual markings to item 1. therefore , items 3 and item 5 were fired from the same firearm as item 1. Items and 4 exhibit sufficient individual markings. Therefore, they are fired from the same firearm. Item 2 and 4 exhibit different individual marking to item to item 1. Therefore, items 2

TABLE 2

WebCode	Conclusions
	and 4 were not fired from the same firearm as items 1, 3, and 5.
VQRV42	The two (2) fired bullets, items 3 and 5, were each identified as having been fired in the Ruger pistol, item 1. The two (2) fired bullets, items 2 and 4, were consistent in all observable class characteristics (caliber, number of lands and grooves, rifling, twist, and widths of lands and grooves) as the Ruger pistol, item 1. However, due to a lack of reproducible individual microscopic markings, the bullets could neither be eliminated nor identified as having been fired in the Ruger pistol. The results are inconclusive. The fired bullet, item 4, was consistent in all observable class characteristics (caliber, number of lands and grooves, rifling, twist, and widths of lands and grooves) as the fired bullet, item 2. However, due to a lack of reproducible individual microscopic markings, the bullets could neither be eliminated nor identified as having been fired in the same firearm. The results are inconclusive. Note: Laboratory policy prohibits eliminations based on individual characteristics.
VR3KLT	Exhibits #3 and #5 were fired from Exhibit #1. Exhibits #2 and #4 were fired from the same firearm. Exhibits #2 and #4 could not be identified or eliminated as having been fired from Exhibit #1.
VH6AT	The Item 2 and 4 bullets were identified, within the limits of practical certainty <sup>1</sup> , as having been fired from the same firearm. The Item 3 and 5 bullets were identified, within the limits of practical certainty <sup>1</sup> , as having been fired from the same firearm as the Item 1 test fired bullets. The Item 2 and 4 bullets were not fired from the same firearm as the Item 1 test fired bullets. *There are two (2) firearms represented.
VXQ8A7	Microscopic Comparison made between Test Shot Projectiles (Item 1) from the submitted Firearm and evidence Projectiles recovered at the scene (Items 2 thru Item 5) with the following results: Item 2 Negative / Elimination, Item 3 Positive / Identification, Item 4 Negative / Elimination, Item 5 Positive / Identification. Items 3 and 5 were both fired from the submitted Firearm.
W3JKXF	Items 3 and 5 were fired in the same firearm as Item 1. Items 2 and 4 were fired in a second 9mm firearm, based on differences in individual characteristics.
W4QBCA	Item 3 and Item 5 were fired in the same firearm as the Item 1 test fires. Item 2 was not fired in the same firearm as the Item 1 test fires. It is not possible to conclude if Item 4 was fired in the same firearm as the Item 1 test fires until a test fires with the same type of ammunition is obtained.
W9H99T	Items 3 and 5: The bullets were identified as having been fired from the recovered firearm. Items 2 and 4: The bullets were identified as having been fired from the same unknown firearm. Furthermore, the bullets were not fired from the recovered firearm. The bullets were determined to be of 9mm caliber displaying rifling characteristics of six lands and grooves, right twist. Manufacturers of firearms with similar rifling characteristics include, but are not limited to Beretta, FN/Browning, Ruger, and Walther.
WC9BF2	A- The bullets described in items 1, 3 and 5, are 9 mm caliber with right rifling (R-6) and were fired by the same firearm. B- The bullets described in items 2 and 4, are 9 mm caliber with right rifling (R-6) and were fired by the same firearm.
WHRTEV	The test fired bullets in Item 1 identified as being from a Ruger Model SR9C, 9mm Luger caliber, semi-auto pistol, were microscopically examined in conjunction with Items 2, 3, 4, and 5. Based on these comparative examinations, it was determined that: A. Items 3 and 5 had both been fired through the same barrel as the test bullets in Item 1. B. Items 2 and 4 bear the same class characteristics as the test bullets in Item 1, however, no individual characteristics were found to link Items 2 and 4 as having been fired through the same barrel as Item 1. C.

TABLE 2

WebCode	Conclusions
	<p>Items 2 and 4 bear the same class and some similar individual characteristics to each other and could have been fired through the barrel of the same firearm. However, a difference in type and design precludes a more conclusive determination. Any suspect firearm(s) encountered during the course of this investigation should be forwarded to this laboratory for comparison purposes to Items 2 and 4. Items 2, 3 and 5 are consistent in type and design with the bullets represented by Item 1. Item 4 is consistent in type and design with Federal brand 9mm Luger caliber jacketed-hollow point bullets sold under the trade name, Hydra-Shok.</p>
WM2ZRT	<p>3. On 2017-11-16 during the performance of my official duties I received a sealed evidence bag with number PA4001476936 from Case Administration of the Ballistics Section, containing the following items: 3.1 Item 1 containing the following: 3.1.1 Three (3) 9mm calibre fired bullets each marked "1". 3.2 Item 2 containing the following: 3.2.1 One (1) 9mm calibre fired bullet marked "2". 3.3 Item 3 containing the following: 3.3.1 One (1) 9mm calibre fired bullet marked "3". 3.4 Item 4 containing the following: 3.4.1 One (1) 9mm calibre fired bullet marked "4". 3.5 Item 5 containing the following: 3.5.1 One (1) 9mm calibre fired bullet marked "5". 4. The intention and scope of this forensic examination comprises of the following: 4.1 The examination and identification of fired bullets. 4.2 Microscopic individualization of fired bullets. 5. I examined the fired bullets mentioned in paragraphs 3.1.1, 3.2.1, 3.3.1, 3.4.1 and 3.5.1 and compared the individual and class characteristics markings on them using a comparison microscope and found that they were fired from different firearms as follows: 5.1 The bullets mentioned in paragraphs 3.1.1, 3.3.1 and 3.5.1 marked "item 1", "item 3" and "item 5" respectively were fired from a 1st firearm. 5.2 The bullets mentioned in paragraphs 3.2.1 and 3.4.1 marked "item 2" and "item 4" respectively were fired from a 2nd firearm.</p>
WQ9A86	<p>The two 38 caliber class bullets (Items 2 and 4) were fired from the same firearm, however they were not fired from the same firearm as the test fired bullets (Item 1) from the Ruger SR9C firearm. The two 38 caliber class bullets (Items 3 and 5) were fired from the same firearm as the test fired bullets (Item 1) from the Ruger SR9C firearm.</p>
WREJAA	<p>After examining the ballistic elements, the Ruger SR9C pistol, seized from the suspect, has been used to fire two bullets recovered from the crime scene: item number 3 (collected from the wall) and item number 5 (collected fro the ceiling). Remaining questioned bullets fired, codified as items num. 2 and 4, has been fired by the same 9mm Luger pistol, but different from the Ruger seized.</p>
WUZMH8	<p>The fired bullets (items 3 and 5) were fired from the same firearm that fired item 1 (said to be a Ruger SR9c pistol). The conclusion that sufficient agreement for identification exists means that the likelihood another firearm could have fired the submitted bullets cases is so remote as to be considered a practical impossibility. The fired bullets (items 2 and 4) were eliminated as having been fired from the same firearm that fired item 1 (said to be a Ruger SR9c pistol). I noted agreement of all discernible class characteristics between the fired bullets (items 2 and 4). I also noted excellent agreement of the microscopic markings in the land impressions that would be sufficient quality and quantity to identify these two bullets as having been fired from the same firearm, assuming the markings are individual in nature, and not from subclass carryover. Subclass carryover may occur in some manufacturing processes, such as firearm barrel manufacturing. Theses process have the potential to produce multiple units with carryover of fine detail from the tooling to the manufactured items. Without the firearm to evaluate, I was unable to eliminate the possibility of subclass markings on the bullets. Therefore, it is possible that the submitted bullets (items 2 and 4) were fired from the same firearm, or in a limited number of firearms manufactured using the same tooling at or near the same time. If a firearm is submitted, I can revisit this examination.</p>

TABLE 2

WebCode	Conclusions
WXL8T3	On the one hand, the questioned items 3 and 5 were shot in the same firearm as the known bullets from item 1. On the other hand, the questioned items 2 and 4 were fired in another an unique firearm.
WZCBH4	The fired bullets submitted as Items 2, 3, 4, and 5 were microscopically compared to each other and to the said test fired bullets submitted as Item 1 and it was determined that: Based upon matching microscopic, two bullets (item 3 and 5), were identified as having been fired in the suspect's firearm (item 1). The remaining bullet (item 2) was fired in a different firearm. The remaining bullet (item 4) was fired in a different firearm.
WZRU32	The submitted questioned bullets had microscopic details that matched those on the fired bullets from the recovered firearm hence all being fired by the same firearm that was used to fire the known bullets.
X8LAB7	Items 3 and 5 were identified as having been fired from Item 1. Items 2 and 4 were identified as having been fired from the same unknown firearm. (Unknown firearm #1).
XB8VM2	Items 1, 3 and 5 were fired from the same firearm. Items 2 and 4 were fired from the same firearm; however, they were not fired from the same firearm as Items 1, 3 and 5. Items 2 and 4 were fired from a firearm capable of chambering and firing a 9mm Luger caliber cartridge having 6 lands and grooves inclined to the right. The possible firearms which could have fired Items 2 and 4 are too numerous to list.
XDBUEL	On examination, I found: i. The individual characteristic marks on the recovered bullets Item 3 and Item 5 to be similar to the individual characteristic marks on the known bullets Item 1. ii. The individual characteristic marks on the recovered bullets Item 2 and Item 4 to be dissimilar to the individual characteristic marks on the known bullets Item 1. Therefore, I am of the opinion that: i. The recovered bullets Item 3 and Item 5 were fired from the recovered firearm. i. The recovered bullets Item 2 and Item 4 were not fired from the recovered firearm.
XDVHRA	1. The bullets identify as item 2 and item 4 belong to a 9 mm caliber, and were fired by the same handgun which is different than the one that generated item 1. 2. The bullets identify as item 3 and item 5 belong to a 9 mm caliber, and were fired by a Ruger SR9C 9mm handgun, the same that generated item 1.
XKRDP9	The recovered gun is not the firearm used to shoot the victim. The bullet in item 4 from the victim is of the Hollow Point category (similar to Federal Hydra-shock) and has been fired from the same weapon as the bullet in item 2.
XLT464	On examination, I found that the characteristic marks on the bullet recovered from the wall at the scene (Item 3) and from the ceiling of the scene (Items 5) is the same with the characteristic marks on the bullet fired using the recovered firearm (Item 1). I also found that the characteristic marks on the bullet recovered from the wall at the scene (Item 2) is not same with Item 1. Item 4 is inconclusive.
XPM6ZQ	(a) The questioned bullets marked 3 and 5 (items 3 and 5) were fired from the same firearm as the known bullets (item 1). (b) The questioned bullets marked 2 and 4 (items 2 and 4) were fired from a second firearm (unknown firearm).
Y36CAW	a) It is Establishes that the pistol that fired three bullets identified as Item 1, was the same that was used to shoot the two bullets caliber real 9 mm identified as Item 3 and Item 5. b) The two bullets identified as item 2 and item 4 based on its morphology and classes characteristics corresponds to the real caliber 9 mm and were fired by one same weapon, but due to the irregular identity characteristics it is not possible to affirm or deny that the firearm that fired these bullets is the same that the one that shot the three bullets identified as item 1.

TABLE 2

WebCode	Conclusions
Y3ARPH	Items 1, 3 and 5 are .38 caliber /9mm copper jacketed bullets that were identified as having been fired from the same barrel. Item 2 and Item 4 are .38 caliber/9mm copper jacketed round nosed bullet, and a copper jacketed hollow point bullet that were fired from the same barrel, rifled with six grooves, right twist. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 2 and Item 4 bullets were fired from the same barrel as the Item 1, 3 and 5 bullets.
Y3CCLX	Item 1: The item 1 fired bullets are consistent in class characteristics with the items 2, 3, 4 and 5 submitted fired bullets. Item 2: The item 2 fired bullet is consistent in class characteristics with the items 1, 3, 4 and 5 submitted fired bullets. Item 3: The item 3 fired bullet is consistent in class characteristics with the items 1, 2, 4 and 5 submitted fired bullets. Item 4: The item 4 fired bullet is consistent in class characteristics with the items 1, 2, 3 and 5 submitted fired bullets. Item 5: The item 5 fired bullet is consistent in class characteristics with the items 1, 2, 3 and 4 submitted fired bullets. Item 1 was compared to items 2 and 4. Due to dissimilarities in individual characteristics, the Items 2 and 4 fired bullets were eliminated as having been fired from the same firearm as the Item 1 fired bullets. Item 1 was compared to items 3 and 5. The Items 1, 3 and 5 fired bullets were identified as having been fired from the same firearm.
Y4ZYQ7	Item1 and Item3, Item5 seemed to be fired from the same firearm.
Y6DDLX	1. Examinations showed Item 3 and Item 5 were discharged from the same firearm as Item 1. 2. Examinations showed Item 2 and Item 4 were not discharged from the same firearm as Item 1. 3. Item 2 and Item 4 were discharged from the same unknown firearm.
YB2ZEF	Item 001-03 and Item 001-05 were discharged from the same firearm that discharged Items 001-01A, 001-01B, and 001-01C. In the comparison of Item 001-01B to Items 001-02 and 001-04 I observed agreement of all discernible class characteristics with no significant agreement or disagreement of individual characteristics. Therefore, Items 001-02 and 001-04 could have been discharged from the same firearm as Item 001-01B, or any other firearm with similar class characteristics. However, a more definitive conclusion may be possible if the suspect firearm was made available for further evaluation.
YBP9LX	Item 3 recovered from the wall at the scene and Item 5 recovered from the ceiling at the scene were fired by the handgun Ruger, SR9C 9x19 mm sized from the suspect's residence. Item 2 recovered from the wall at the scene and item 4 recovered from the victim were fired by the same firearm, however were not fired by the handgun Ruger, SR9C 9X19 mm sized from the suspect's residence.
YBWUN6	Items 3 and 5 were fired from the same firearm as Item 1 (known bullets fired in the Ruger pistol). Items 2 and 4 were not fired in the same firearm as Item 1, but they were fired from the same firearm as each other.
YG9QJ7	Item 1 - Three spent 9mm caliber full metal jacketed bullets reportedly fired from a 9mm caliber Ruger SR9c pistol. The test bullets were microscopically compared to the bullets listed below. Item 3 - One spent 9mm caliber full metal jacketed bullet reportedly recovered from wall (second bullet). Item 5 - One spent 9mm caliber full metal jacketed bullet reportedly recovered from ceiling. The bullets described above both had a weight of 114.9 grains and a classification of six lands and grooves with a right-hand twist. The bullets matched the Item 1 test bullets reportedly discharged from a 9mm caliber Ruger model SR9c pistol. The identifications were based on the agreement of individual characteristics observed during a microscopic comparison. Item 2 - One spent 38/357/9mm caliber full metal jacket bullet reportedly recovered from wall (first bullet). Item 4 - One spent 38/357/9mm caliber jacketed hollow-point bullet reportedly recovered from victim. The bullets described above had weights

TABLE 2

WebCode	Conclusions
	of 114.4 and 110.0 grains, respectively, and a classification of six lands and grooves with a right-hand twist. The bullets matched each other and were discharged by the same firearm. The identifications were based on the agreement of individual characteristics observed during the microscopic comparison. The bullets were microscopically compared to the Item 1 test bullets as well as the Items 3 and 5 bullets and were eliminated as having been discharged from that firearm. The eliminations were based on differences in individual characteristics observed during the microscopic comparison.
YPN8D2	Item 3 and Item 5 were identified microscopically as having been fired from the same firearm as the test fires, referencing Item 1, based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 and 4 were identified microscopically as having been fired from the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Item 2 and 4 were eliminated as having been fired from the same firearm as the test fires, referencing Item 1, due to disagreement of individual characteristics.
YT842R	I conducted a microscopic comparison of known test Item 1 with exhibit Items 2, 3, 4 & 5. Items 3 and 5 were an identification and a match to the test bullets of Item 1. Items 2 and 4 were not a match based on differing individual characteristics observed and are eliminated. Items 2 and 4 however were a match to each other and were fired in the same firearm, but not the one that produced Items 1, 3 and 5.
YTGKPP	I examined the fired bullets marked Items 1 to 5 and compared the individual and class characteristics markings on them using a comparison microscope and found: 2.1 The bullets marked Items 3 and 5 were fired in the same firearm as the bullets marked Item 1. 2.2 The bullets marked Items 2 and 4 were fired in the same firearm, but not the same firearm as mentioned in 2.1.
YZ4WER	Item 3 and Item 5 were identified microscopically as having been fired from the same firearm as Item 1A based on the agreement of a combination of individual characteristics and all discernible class characteristics. Item 2 was identified microscopically as having been fired from the same unknown firearm as Item 4 based on the agreement of a combination of individual characteristics and all discernible class characteristics. Item 2 and Item 4 were eliminated as having been fired from the same firearm as Item 1A due to the disagreement of individual characteristics.
Z4233W	Items 3 and 5 are two (2) fired 9mm caliber projectiles having 6 land and groove impressions with right hand twist. Microscopic comparisons determined that Items 3 and 5 were fired in the same firearm as the known bullets (Item 1) based on agreement of striae in the land impressions.
Z4LLAP	The Item 3 and 5 bullets were identified, within the limits of practical certainty, as having been fired from the recovered firearm that was used to generate the Item 1 test fired bullets. The Item 2 and 4 bullets were identified, within the limits of practical certainty, as having been fired from the same firearm. The Item 2 and 4 bullets were not fired from the recovered firearm that was used to generate the Item 1 test fired bullets.
Z9VYT9	Items #2, #3, #4, and #5 were examined and found to be consistent with 9 mm/38 class caliber. Item #1 and Item #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #1 and #5 are identified as having been fired from the same firearm. Item #2 and Item #4 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #2 and #4 are identified as having been fired from the same firearm.

TABLE 2

WebCode	Conclusions
	<p>Item #2 and Item #1 were microscopically examined and compared. Based on the observed disagreement of individual characteristics, Items #2 and #1 are eliminated as having been fired from the same firearm. Item #2 and Item #3 were microscopically examined and compared. Based on the observed disagreement of individual characteristics, Items #2 and #3 are eliminated as having been fired from the same firearm. Item #1 and Item #3 were microscopically examined and compared. There is observed agreement of their class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate the items as having been fired from the same firearm. The evidence is being retained at the laboratory.</p>
Z9WUCE	<p>Items 1A, 1B, 1C, 2, 3, and 5 were nominal .38 (consistent with 9mm Luger) caliber copper full-metal jacketed bullets that had been fired through a barrel with conventional right twist rifling of six lands and grooves. Item 4 was a nominal .38 (consistent with 9mm Luger) caliber, copper jacketed hollow-point bullet that was fired through a barrel with conventional right twist rifling of six lands and grooves. The bullet design is consistent with Hydra-Shok ammunition marketed by Federal. Item 2 was compared to items 1A, 1B, and 1C using a comparison microscope. Class characteristics agreed, however significant disagreement of individual characteristics was observed. Item 2 was not fired in the same firearm as items 1A, 1B, and 1C. Item 3 was compared to items 1A, 1B, and 1C using a comparison microscope. Corresponding class characteristics and individual characteristics sufficient for an identification were observed. Item 3 was fired in the same firearm as items 1A, 1B, and 1C. Item 4 was compared to items 1A, 1B, and 1C using a comparison microscope. Class characteristics agreed, however significant disagreement of individual characteristics was observed. Item 4 was not fired in the same firearm as items 1A, 1B, and 1C. Item 5 was compared to items 1A, 1B, and 1C using a comparison microscope. Corresponding class characteristics and individual characteristics sufficient for an identification were observed. Item 5 was fired in the same firearm as items 1A, 1B, and 1C. Item 2 was compared to item 4 using a comparison microscope. Corresponding class characteristics and individual characteristics sufficient for an identification were observed. Item 2 and item 4 were fired in a single firearm.</p>
ZFCEFQ	<p>MICROSCOPIC COMPARISONS BETWEEN EVIDENCE BULLET SPECIMENS Q1B THROUGH Q4B (ITEM 2 THROUGH ITEM 5) AND THE TEST FIRED BULLET SPECIMENS FROM RECOVERED RUGER FIREARM K1 (ITEM 1) REVEAL THAT SUFFICIENT AGREEMENT OF INDIVIDUAL CHARACTERISTICS EXISTS TO IDENTIFY THE FOLLOWING: Q2B (ITEM 3) AND Q4B (ITEM 5) WERE FIRED WITH RECOVERED FIREARM (RUGER SR9C, 9MM LUGER) K1 (ITEM 1). Q1B (ITEM 2) WAS NOT FIRED WITH RECOVERED RUGER FIREARM K1 (ITEM 1) DUE TO DIFFERENCES OF INDIVIDUAL CHARACTERISTICS MARKINGS. Q3B (ITEM 4) WAS ALSO NOT FIRED WITH RUGER FIREARM K1 (ITEM 1) OR WITH THE SAME UNKNOWN FIREARM AS Q1B (ITEM 2), DUE TO Q3B (ITEM 4) EXHIBITING A DIFFERENCE OF LAND AND GROOVE WIDTH DIMENSIONS WHEN COMPARED AGAINST Q1B, Q2B, Q4B, AND THE TEST FIRED BULLET SPECIMENS FROM RECOVERED RUGER FIREARM K1 (ITEM 1). SHOULD ANY ADDITIONAL FIREARMS BE RECOVERED, SUBMIT, AND REFER TO THE ABOVE CC#.</p>
ZFVJTI	<p>1. Exhibits 2, 3, 4, and 5 (four 9mm bullets) were microscopically compared to Exhibit 1 (three 9mm bullets labeled as test fires from the recovered Ruger SR9C pistol). a. Exhibit 3 and Exhibit 5 were identified as having been fired from the same firearm as Exhibit 1. b. Exhibit 2 and Exhibit 4 were identified as having been fired from the same firearm, however not the same firearm that fired Exhibits 1, 3, and 5.</p>
ZPFPQM	<p>Item #1 was used for comparison purposes with Items #2, #3, #4, and #5. Item #2 and #4 were fired in the same firearm, which is not the same firearm that fired Items #1, #3, and #5.</p>

TABLE 2

WebCode	Conclusions
ZV73RB	<p>Items #3 and #5 were fired from the same firearm as Item #1.</p> <p>Item 1.1 consists of three fired 9mm bullets stated to have been fired using the recovered firearm. Items 1.2, 1.3, 1.4, and 1.5 are four fired 9mm bullets. They were microscopically compared to Item 1.1 and to each other. Items 1.3 and 1.5 were identified as having been fired by the same firearm that fired Item 1.1. Items 1.2 and 1.4 were eliminated as having been fired by the same firearm that fired Item 1.1. They were identified as having been fired by the same firearm.</p>
ZZVLPY	<p>Item 3 and item 5 were fired by the hand gun Ruger SR9C with seized from the suspect's residence. Item 2 and item 4 were fired by another hand gun.</p>

## Additional Comments

TABLE 3

WebCode	Additional Comments
23HHTJ	Item 2 and item 4 are fired by the same firearm but different than items 1-3-5. --> 2 firearms differents.
2HWJTF	Exhibits #2 and #4 marked inconclusive to the firearm in Exhibit #1, due to insufficient detail of individual caharacteristics for an identification or elimination. * also a microscopic comparison of Exhibits #3 and #5 to Exhibits #2 and #4 was performed.
2VME8U	The projectiles in Items 2 and 4 were fired in the same gun.
4CHV2H	Items 1-2-1 and 1-4-1 could not be identified or eliminated as having been fired by the same gun that test fired the item 1-1-1 bullets and the item 1-5-1 bullet. These inconclusive conclusions are based on insufficient similarities and insufficient dissimilarities in the patterns of microscopic marks observed between the items and the bullets to which they were compared.
4KEPZG	We strongly support the hypothesis that items 2 and 4 fired from the same firearm.
6E4TV7	Exhibits #2 and #4 compared to Exhibit #1 - A microscopic comparison was performed; however, there is insufficient detail of the class and/or individual characteristics for an identification or elimination finding.
6JV43J	A microscopic comparison was performed between items #1, #2, and #4. There was agreement of discernible class characteristics but not individual characteristics. In this situation it is our laboratory policy to call these inconclusive.
6XYDXK	A Federal Hydra Shok bullet removed from the victim had been fired from a pistol also firing a full metal jacket bullet. Two pistol had fired the bullets contained in Items 2 to 5.
7G9YRR	Items 1-02-AA and 1-04-AA were fired from a firearm capable of chambering and firing a 9mm Luger caliber cartridge with six lands and grooves, conventionally rifled with a right twist. Possible manufacturers of the firearm that fired Items 1-02-AA and 1-04-AA include, but should not be limited to: Beretta, Czechoslovakia, FN/Browning, Heckler & Koch, Keltec, Luger, Ruger, Tanfoglio, and Walther.
7NNH8K	Items 2 and 4 were fired by the same firearm but a different firearm to the recovered firearm Item 1.
7RPL2T	Lab policy is to mark items inconclusive if there are matching class characteristics and a limited amount of individual characteristics.
82679U	I compared the firing marks present on the bullet items 2 and 4 and found there was significant matching detail. In my opinion, they had been fired in the same gun. It was not possible to determine the exact make and model of the gun that fired the bullet items 2 and 4 as there were a number of possible makes and models which produce firing marks similar to those present, including Ruger self-loading pistols.
84FWNQ	Compared the submitted fired bullets, Items 2 and 4, to test fires produced by the submitted Ruger pistol. Similarities of class characteristics noted. Due to lack of individual characteristics, was unable to eliminate or identify the submitted fired bullets, Items 2 and 4, as having been fired from the submitted Ruger pistol.
8669G4	Item 4 is a full copper jacketed expanded bullet where nose part was broken into five fragments. This deformation make difficult to find suitable striation for comparison with the test fired bullets.

TABLE 3

WebCode	Additional Comments
8ET2RF	more test shots would be needed to be fired from the recovered known firearm. The fired bullet in Item 4 was of a different type and possible manufacture than the other fired bullets
8JM3PM	Item 4, the bullet recovered from the victim, and item 2, the bullet recovered from the wall are in sufficient agreement and are identified as having a common origin, being fired from the same barrel of a second unknown firearm, also present at the shooting scene.
8U7GRP	the bullet number 2 and the bullet number 4 have the identity characteristics common.
8ZAF8L	A microscopic comparison was performed; however, there is insufficient detail of the class and/or individual characteristics for an identification or elimination finding.
96JUQ7	Item (1) and (2) had agreement of all discernable class characteristics and disagreement of individual characteristics but insufficient for an elimination. Item (1) and (4) had agreement of all discernable class characteristics and disagreement of individual characteristics but insufficient for an elimination.
987FFM	There was only 1 set of reference projectiles . The reference projectiles were FMJ full metal jacket projectiles as the Item 4 ( victim) was a heavier hollow point type projectile .
9GZGZ7	Although significant agreement between Items 2 and 4 and Item 1 (test-fired bullets) was not noted, laboratory policy discourages eliminations between items based on individual characteristics only.
9NY7JW	#2 and #4 exhibited agreement of discernible class characteristics but were inconclusive due to a disagreement of individual characteristics, but insufficient for an elimination.
9U3A8A	Methods: Bullets: Two bullets, either two evidence items or one evidence item and one bullet test fired in the Laboratory, undergo two stages of comparison. First, the bullets are examined to determine and compare their class characteristics. The class characteristics of fired bullets include diameter, number of land and groove impressions, direction of twist, and the widths of the land and groove impressions. If the class characteristics of the two bullets are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the striated marks present on two bullets to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two bullets have different class characteristics, an Exclusion opinion is rendered. Exclusion opinions based on a measured class difference or the physical comparison of a discernible difference in class characteristics cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the Examiner has ever observed in previous evaluations of bullets known to have been fired from different barrels. b) The degree of similarity is equivalent to that normally observed in bullets known to have been fired from the same barrel. When these conditions are met the likelihood another tool (firearm) could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for Identification. GRC: The appropriate GRC measurements are entered in the database, which then returns a list of all firearms in the

TABLE 3

WebCode	Additional Comments
	database with compatible GRCs. Limitations: Bullets: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to random changes in barrels such as wear, corrosion and lead accumulation, bullets fired from the same barrel are sometimes not identifiable as such. Additionally, some barrel manufacturing methods routinely produce barrels that leave limited microscopic marks of value on fired bullets. Damaged, corroded or fragmented bullets may be of little or no value for comparison purposes. GRC: The GRC database contains information obtained from firearms at the Laboratory and from voluntary submissions of test-fired specimens from law enforcement agencies around the world. It is not a comprehensive list of all firearms, and contains no information about the numbers of each type of firearm present in the general population. The firearms listed in the report are typically those considered to be more common and are included at the discretion of the examiner authoring the report.
9VTH9X	The cartridge cases in items 2 and 4 were fired in the same gun.
9ZD3KT	The class characteristics of Items 2 and 4 are not sufficiently different than those of Item 1 to serve as a (class characteristic) basis for an elimination. Eliminations in this laboratory are based on differences in class characteristics and/ or distinct differences in reproducible patterns of individual characteristics.
9ZVCDU	The inconclusive result of items 2 and 4 to item 1 was based on some agreement of individual characteristics and some disagreement of individual characteristics. There was not sufficient agreement to support an identification, and there was not sufficient disagreement to support an elimination.
A6K7R8	Microscopic examination conducted with Item #2 and Item #4. The fired bullets in Item #2 and Item #4 have the same class characteristics, but there is insufficient similar/different individual characteristics to render an opinion as to if the firearm in Item #1 is or is not the particular firearm which fired the bullets in Item #2 and Item #4.
BNCJXJ	Similarities have been observed between the marks in Item 2 and Item 4. This observation lead to an additional examination between the marks in Item 2 and Item 4. The findings of this examination were viewed under the following two hypotheses: H3: The bullets were fired through the barrel of the submitted firearm. H4: The bullets were fired through two different barrels of the same caliber and with the same class characteristics. The findings of the additional examination are extremely more probable when H3 is true than when H1 is true.
D9CENC	Exhibit fired bullets listed as item 2, and 4 were not fired from the same firearm.
E2LGCU	Firearms manufactured with general rifling characteristics similar to the two bullets (Lab Items 2 and 4) include a large number of manufacturers.
EC7TQT	Reference: SWGGUN Elimination factors related to FA/TM examinations was used to assess conclusion of elimination.
ETQJM7	Comparisons between Items 2 and 4, the bullets, were inconclusive due to insufficient corresponding individual microscopic characteristics.
EVZBWM	The class characteristics of Items 2 and 4 are not sufficiently different than those of Item 1 to serve as a (class characteristic) basis for elimination. Eliminations in this laboratory are based on differences in class characteristics and/or distinct differences in reproducible patterns of individual characteristics.
FDVNJE	Items 2 and 4 are consistent with bullets from ammunition designated 9mm Luger. A list of makes of firearms that may have fired these items is not provided due to its extensive length.

TABLE 3

WebCode	Additional Comments
FENC6V	Exhibits #2 and #4 were compared to Exhibits #1, #3, and #5. Though a microscopic comparison was performed, there is insufficient detail in the individual characteristics between Exhibits #2 and #4 (Group 1) AND Exhibits #1, #3, and #5 (Group 2), a limited group sample size, and limited surface area available for comparison (due to the expanded nature of hollow-point bullet in Exhibit #4 obscuring bearing surface detail and the missing jacketing on Exhibit #4) for an identification or elimination finding.
H2BTJ7	Elimination of Items 2 and 4 from Items 1, 3, and 5 was based on differences in patterns of individual characteristics. This would be subject to verification.
H9B7NF	The bullets (Items 01-02 and 01-04) were not identified or eliminated as having been fired from the same Ruger pistol that fired the bullets (Item 01-01) due to the agreement of class characteristics, but lack of repeatable individual characteristics; the result is inconclusive.
JD6MDE	Items 01-02 and 01-04 were unable to be identified or eliminated as having been fired in the same firearm as the Items 01-01, 01-03, and 01-05 bullets based on agreement of all discernible class characteristics with some disagreement of individual characteristics, but insufficient for an elimination. In the future, if the "Unknown" bullets have different manufacturer design characteristics from each other, it is requested that "Known" bullets of each design be included in the test, as in casework the examiner will make every effort to generate "Known" bullets as similar to the "Unknown" ones as possible to minimize variables.
JXNJ4D	Items 2 and 4 to Items 1, 3, and 5 have agreement of all discernible class characteristics and disagreement of individual characteristics but insufficient for an elimination.
KT9H6C	The quality of the samples was good. The difficulty of the test was appropriate.
KUNMZ4	Exhibits #2 and #4 could not be identified or eliminated as having been fired from Exhibit #1 - The class characteristics are consistent however, there is insufficient detail within the individual characteristics to support an identification or elimination finding.
LGUTZF	The bullets T1 and T3 were both fired by the same (unknown) firearm, but not from the same firearm as the bullets in Item 1.
LHP43A	*Inconclusive results were due to the insufficient agreement or disagreement of individual characteristics. Additional Comments: In case work I would have test fired ammunition that was consistent with the styles of all of the evidence, especially bullets recovered from victims. For example, in this case I would have test fired at least two or three rounds of FMJ ammunition consistent with the scene bullets and two or three rounds of JHP ammunition consistent with the bullet recovered from the victim. In the future, my suggestion would be to include 2 fmj bullets and 2 jhp bullets in the known test fired bullet item.
LTPYXK	The bullets identified as item 3 and item 5 were fired by the same gun. The bullets identified as item 2 and item 4 were not fired by the same weapon that fired the bullets identified as item 1.
LWKX43	Fired bullets marked 531660/17 A2 x A4 are positive with each other - land and grooves corresponds.
LZNJZF	Item 2 and 4 bullets were fired from the same firearm.
M8JTZC	The exercise was practical for the application to the comparative studies of bullet that ballistics group of [City] in [Country] activity that is veri frequent in this laboratory by Material evidence submitted for analysis of criminal cases which use one or more firearms.
ME7NR9	Items 2 and 4 have been fired with the same firearm.

TABLE 3

WebCode	Additional Comments
MELYGZ	Laboratory No. for this case is 531617/17. Bullets were marked with laboratory number 5311617/17 and added letter "D" in front of CTS markings. Whereas, bullets fired from the recovered firearm were marked by me with last 3 digits of laboratory number and TB stands for test bullet.
MFH9UQ	IN CONCLUSION TWO GUNS HAVE BEEN UTILISED IN THIS INCIDENT
MJRVZ	Two firearm were used where the recovered firearm was used to discharge Items 3 and Item 5 and a second (unknown) firearm was used to discharge Item 2 and Item 4.
MMURQV	<p>Methods: Association: Association examinations compare the physical and class characteristics of evidence items. An association conclusion is reached if the observable or measurable physical dimensions and design features of two items are in agreement, or are "physically consistent." If these dimensions and features are clearly different, an elimination conclusion is reached. If there is a lack of observable design features or measurable dimensions, the result is inconclusive. Bullets: Two bullets, either two evidence items or one evidence item and one bullet test fired in the Laboratory, undergo two stages of comparison. First, the bullets are examined to determine and compare their class characteristics. The class characteristics of fired bullets include diameter, number of land and groove impressions, direction of twist, and the widths of the land and groove impressions. If the class characteristics of the two bullets are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the striated marks present on two bullets to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two bullets have different class characteristics, an Exclusion opinion is rendered. Exclusion opinions based on a measured class difference or the physical comparison of a discernible difference in class characteristics cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the Examiner has ever observed in previous evaluations of bullets known to have been fired from different barrels. b) The degree of similarity is equivalent to that normally observed in bullets known to have been fired from the same barrel. When these conditions are met the likelihood another tool (firearm) could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for Identification.</p> <p>GRC: The appropriate GRC measurements are entered in the database, which then returns a list of all firearms in the database with compatible GRCs. Limitations: Association: Association examinations are used to determine if two items are from a restricted group source and cannot be used to determine whether two items are from a unique source. Bullets: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to random changes in barrels such as wear, corrosion and lead accumulation, bullets fired from the same barrel are sometimes not identifiable as such. Additionally, some barrel manufacturing methods routinely produce barrels that leave limited microscopic marks of value on fired bullets. Damaged, corroded or fragmented bullets may be of little or no value for comparison purposes. GRC:</p>

TABLE 3

WebCode	Additional Comments
	The GRC database contains information obtained from firearms at the Laboratory and from voluntary submissions of test-fired specimens from law enforcement agencies around the world. It is not a comprehensive list of all firearms, and contains no information about the numbers of each type of firearm present in the general population. The firearms listed in the report are typically those considered to be more common and are included at the discretion of the examiner authoring the report.
MVNR89	The first bullet recovered the wall at the scene (identified as Item 2) and the bullet recovered from the victim (identified as Item 4) were fire by the same firearm.
MYBEZW	This department's SOP's require that two bullets having the same general rifling characteristics cannot be eliminated for lack of individual characteristics. Item 2 and item 4 bear similar marks to item 1, item 3 and item 5, but the marks are out of phase. This is a common trait with sub-class characteristics from two related sources.
N6RDN8	Items 2 and 4 to Items 1, 3, and 5 have agreement of all discernible class characteristics and disagreement of individual characteristics but insufficient for an elimination.
N6XEZA	One of the bullets (4) is consistent with Federal Hydra-Shok ammunition.
NP32JT	Items #2 and #4 were both fired from one firearm (not Item #1) based on the agreement of the class characteristics and patterns of sufficient corresponding individual characteristics.
PA2PMT	Methods: Bullets: Two bullets, either two evidence items or one evidence item and one bullet test fired in the Laboratory, undergo two stages of comparison. First, the bullets are examined to determine and compare their class characteristics. The class characteristics of fired bullets include diameter, number of land and groove impressions, direction of twist, and the widths of the land and groove impressions. If the class characteristics of the two bullets are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the striated marks present on two bullets to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two bullets have different class characteristics, an Exclusion opinion is rendered. Exclusion opinions based on a measured class difference or the physical comparison of a discernible difference in class characteristics cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the Examiner has ever observed in previous evaluations of bullets known to have been fired from different barrels. b) The degree of similarity is equivalent to that normally observed in bullets known to have been fired from the same barrel. When these conditions are met the likelihood another tool (firearm) could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for Identification. GRC: The appropriate GRC measurements are entered in the database, which then returns a list of all firearms in the database with compatible GRCs. Limitations: Bullets: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to random changes in barrels such as wear, corrosion and

TABLE 3

WebCode	Additional Comments
	lead accumulation, bullets fired from the same barrel are sometimes not identifiable as such. Additionally, some barrel manufacturing methods routinely produce barrels that leave limited microscopic marks of value on fired bullets. Damaged, corroded or fragmented bullets may be of little or no value for comparison purposes. GRC: The GRC database contains information obtained from firearms at the Laboratory and from voluntary submissions of test-fired specimens from law enforcement agencies around the world. It is not a comprehensive list of all firearms, and contains no information about the numbers of each type of firearm present in the general population. The firearms listed in the report are typically those considered to be more common and are included at the discretion of the examiner authoring the report.
PTE9HC	The gun that fired Items 2 and 4 displayed some similarities to 3 and 5 and 1 - subclass? Possibly indicating the 2 guns used to create this test were closely if not consecutively manufactured.
PV3VX7	The TF in Item 1 were compared to the projs. in Items 2-5: Items 3 and 5 were fired in the same gun as the TF in Item 1 (used proj. marked in the lab {1B} and marked in green on the base for orientation. ID'd with some long, medium width stria in grooves in groups and individually and short stria near the base; and some heavy, gross stria on portions of lands and "fanning" off the shoulders of the grooves. Items 2 and 4 have the same class characteristics as the TF in Item 1: caliber and Land & Grooves (number, twist, width); Items 2 and 4 have very fine stria in the grooves that are closely spaced with minimal stria on the lands. Marked in red on the base for orientation. The projectiles in Items 2 and 4 were fired in the same gun. Additional Notes: 3 projectiles in Item 1 are TF
PZB4FA	For the needs of our examinations, we put back in shape the expanded bullet from the "item 4", in order to have a clear view of all the lands inprints of the bullet.
Q67C2W	Exhibits #2 and #4 could not be identified or eliminated as having been fired from the firearm in Exhibit #1. A microscopic comparison was performed; however, there is insufficient detail of the individual characteristics for an identification or elimination finding.
QBUZV2	Policy Guidelines for Interpretation of Comparison Results: Inconclusive (C): Agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for an elimination.
QFMYAW	Regarding the above inconclusive finding, microscopic comparisons were performed; however, there is insufficient detail of the class and/or individual characteristics for any identification or elimination findings.
QLQ3ZV	The two bullets in "Item 2" and "Item 4" were fired from the same firearm.
R84DH6	The questioned bullets named Item 2 and item 4 were fired in the same firearm.
RCGXM6	The projectiles in Items 2 and 4 were fired in the same gun.
RP7VTA	Item 4 are unable to compared because the expanded bullet are damaged.
T3AJGW	The items 1 through 5 bullets were determined to be of 9mm caliber displaying rifling characteristics of 6 lands and grooves, right-hand twist.
TH39CT	A microscopic comparison was performed between Exhibits #2 and #4 and the known samples in Exhibit #1; however, there is insufficient detail of the class and/or individual characteristics for an identification or elimination finding. Some inconsistencies in pattern were noted; however, there is a limited sample size available and one of the two samples available is of a different ammunition type.

TABLE 3

WebCode	Additional Comments
UBYNM3	Because we are instructed to complete this proficiency test as actual case work I chose an "Inconclusive" result rather than an elimination based on the following excerpt from our policy & procedures: Comment: The discipline recognizes that an elimination of a firearm by other than class characteristics is possible but that such an elimination is an exceptional situation. If an examiner arrives at an opinion where he/she eliminates a firearm, for any reason, the examiner must substantiate the reasons supporting his/her opinion and incorporate them into his/her work notes. The following reasons preclude us from considering this an exceptional situation: Bullet said to be from victim, Item 4, marked poorly. Items 2 & 4 showed similar class characteristics to Item 1, however, without actual firearm in my custody, I am unable to conduct additional test fires with ammunition similar to evidence (Item 4 - Federal Hydra shok) to make an elimination.
URL6U7	Questioned Bullets, Items 2 and 4 were not fired in the same firearm as the known fired bullets, Items 1, however they were both fired in a different firearm. Two (2) firearms were used to discharge the questioned bullets, Items 2, 3, 4 and 5.
V66B3Q	All items (#1 through #5) were evaluated for subclass; any potential subclass markings were taken into consideration. However, individual markings were present such that any potential subclass features were not used for identification. Inconclusive findings: A microscopic comparison was performed; however, there is insufficient detail of the class and/or individual characteristics for an identification or elimination finding.
V8YPXW	Some differences were observed when comparing Items 2 and 4 to Items 1, 3, and 5. However, there are also some similarities in the markings when the shoulders of the land impressions are not aligned. I have observed more differences among test fires that I know to be fired by the same firearm than I observed when comparing Items 2 and 4 to Items 1, 3, and 5 which is why I chose inconclusive rather than elimination as my conclusion.
VBVJP7	In my opinion, a microscopical comparison of firing marks between items 2 and 4 has shown there is sufficient disagreement of class and individual characteristic markings to conclusively determine that items 2 and 4 were not fired in the same firearm (Gun 3)
VHEKAP	I noticed differences in the individual characteristics between the items 2 & 4 and the items 1, 3, and 5. With the submission of a firearm, a further evaluation of the potential source of these differences could be possible.
VLC7Y7	Items 2 and 4 exhibit similar class characteristics to item 1. items 2 and 4 could have been fired from a different 9mm luger Ruger pistol or from another pistol with a similar manufacturer.
VQRV42	Note: Laboratory policy prohibits eliminations based on individual characteristics.
VR3KLT	Exhibits #2 and #4 display the same rifling and class characteristics of Exhibit #1. There was an insufficient amount of similarities and differences in the individual pattern on each land impression for an identification or elimination finding.
WH6AT	LIMITATIONS: 1 Practical Certainty: Since it is not possible to collect and examine samples of all firearms, it is not possible to make an identification with absolute certainty. However all scientific research and testing to date and the continuous inability to disprove the principles of toolmark analysis have demonstrated that firearms produce unique, identifiable characteristics which allow examiners to reliably make identifications. Firearms/Toolmark Identification is an empirical science that relies on objective observations and a subjective interpretation of microscopic marks of value.
VXQ8A7	Microscopic Comparison made between two recovered Projectiles (Items 3 and 5) with

TABLE 3

WebCode	Additional Comments
	Positive Results. Items 3 and 5 were both fired from the same (second) Firearm.
W4QBCA	Item 4 is consistent with bullets manufactured under the Federal Premium Hydroshock brand name. In order to make a definitive conclusion a test fire using Federal Premium Hydroshock ammunition would need to be made available.
XDBUEL	The recovered bullets Item 2 and Item 4 have similar individual characteristic marks and were fired from the same firearm.
XLT464	Item 4 is inconclusive because the individual characteristics on the bullet cannot be determined due to the condition of the bullet which is already damaged.
Y36CAW	In the conclusion (b), the bullets identified as item 2 and item 4, it is alleged that they were fired by the same gun; but at the same time we cannot be conclusive affirming if these bullets were fired by the same weapon that fired the three bullets identified as item 1, this is due to the irregular features of identity that present the bullets identified as item 2 and item 4.
YB2ZEF	Items 001-02 and 001-04 appear to have more defined striations within the land impressions than Items 001-01, 001-03, and 001-05. However, overall they all exhibit similar texture, some contour agreement as well as gross striation agreement. Some of this agreement seen could be due to subclass characteristics. The suspect firearm is not available for evaluation or for producing additional test fires. Therefore, I am unable to further evaluate the reproducibility and significance of the similarities and differences seen.
YBWUN6	Eliminations and identifications are made under the following assumptions: (1) the bullets recovered from the scene and victim were left at or near the same time during the incident and/or (2) subclass influence was considered and eliminated prior to submission of the evidence. If these assumptions could not be made, my conclusions may have been different.
YT842R	Items 2, 3 and 5 were FMJ bullets. Item 4 was an expanded semi-jacketed hollow-point which required the jacket petals to be folded away from the base of the bullet prior to microscopic examination.
Z4233W	Items 2 and 4 are two (2) 9mm caliber projectiles having 6 land and groove impressions with right hand twist. Microscopic comparisons determined that Items 2 and 4 were fired in the same unknown firearm based on agreement of striae in the land impressions.
Z4LLAP	Practical Certainty: Since it is not possible to collect and examine samples of all firearms, it is not possible to make an identification with absolute certainty. However all scientific research and testing to date and the continuous inability to disprove the principles of toolmark analysis have demonstrated that firearms produce unique, identifiable characteristics which allow examiners to reliably make identifications.
Z9VYT9	Item #3 is inconclusive to item #1. There is sufficient agreement of class characteristics, but insufficient agreement of individual characteristics. There is some agreement present, enough to include item #3 and possibly being fired from the same firearm as item #1, but not enough agreement (such as is seen between items #1 and #5) to identify item #1 and item #3 as being fired from the same firearm.
ZFCEFQ	"Sufficient agreement" exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility. Sufficient agreement is related to the significant duplication of random toolmarks as evidence by a pattern or combination of patterns of surface contours.
ZPFPMQ	The cross-identification between Items #2 and #4 can be made independently using striated detail present in any one of six land impressions. The elimination of Items #2 and #4 to Item

TABLE 3

WebCode	Additional Comments
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#1 was made using differences in the striated detail present in the land impressions. The identification of Item #3 and #5 to Item #1 can be made independently using striated detail present in any one of six land impressions. The bullets and tests were indexed with an "X" on the base of a land impression.

## Appendix: Data Sheet

### Collaborative Testing Services ~ Forensic Testing Program Test No. 17-527: Firearms Examination

\*\*\*\*\*

DATA MUST BE RECEIVED BY December 18, 2017 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

#### **Accreditation Release Statement**

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is **NOT** intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

#### Scenario:

Police are investigating a shooting that occurred at a residence. The victim was shot once and the bullet was recovered by the medical examiner. Investigators also recovered three bullets from the scene, two from the wall and one from the ceiling. A suspect was apprehended later that day and a handgun was seized from his residence. The firearm is a Ruger SR9C 9mm Luger handgun. Three rounds of PMC Bronze 9mm Luger 115 grain FMJ ammunition (which were consistent with the bullets found at the scene) were fired with the suspect firearm and the bullets collected. Investigators are asking you to compare the recovered bullets from the victim and scene with those test fired in the recovered firearm and report your findings.

Please note the following:

- Each Item is in a labeled jewel box, it is suggested that when the items are removed from their labeled boxes, they be marked according to your laboratory procedure. However, in case the items are separated from their boxes before labeling has occurred, each item has been inscribed with its item number.
- The bullet stated to have been recovered from the victim was never exposed to biological material.

#### Items Submitted (Sample Pack F2):

- Item 1: Three bullets fired using the recovered firearm (known).  
 Item 2: First bullet recovered from the wall at the scene (questioned).  
 Item 3: Second bullet recovered from the wall at the scene (questioned).  
 Item 4: Bullet recovered from victim (questioned).  
 Item 5: Bullet recovered from the ceiling at the scene (questioned).

1.) Were any of the recovered questioned bullets (Items 2-5) fired in the same firearm as the known bullets (Item 1)?

Item 2	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 3	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 4	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 5	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>

\*Should an item(s) be marked "Inconclusive", please document the reason in the Additional Comments section of this data sheet.

**Please return all pages of this data sheet.**

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Collaborative Testing Services ~ Forensic Testing Program

## RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **17-527: Firearms Examination**

This release page must be completed and received by **December 18, 2017** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

### **Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory**

**ANAB** Certificate No. \_\_\_\_\_

(Include ASCLD/LAB Certificate here)

**A2LA** Certificate No. \_\_\_\_\_

### **Step 2: Complete the Laboratory Identifying Information in its entirety**

Signature and Title \_\_\_\_\_

Laboratory Name \_\_\_\_\_

Location (City/State) \_\_\_\_\_

### Accreditation Release

#### **Return Instructions**

*Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.*

*Questions? Contact us 8 am-4:30 pm EST  
Telephone: +1-571-434-1925  
email: forensics@cts-interlab.com*

**Please return all pages of this data sheet.**

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