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FORENSIC TESTING PROGRAM

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Firearms Examination
Test No. 23-5262 Summary Report

Each sample set consisted of three known expended bullets test-fired from a suspect firearm and four questioned expended bullets. Participants were requested to examine these items and report their findings. Data were returned from 280 participants and are compiled into the following tables:

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 known test-fired bullets discharged from the suspect's firearm. Items 2, 3, 4, and 5 each consisted of one bullet recovered from a crime scene. PMC Bronze .40 Smith & Wesson (S&W) 180 Grain FMJ-FP was used for all five items. Participants were requested to determine if any of the recovered questioned bullets (Items 2-5) were discharged from the same firearm as the known bullets (Item 1).

ITEM 1: The bullets in Item 1 were discharged from a CZ 75 P-07 (SN: A758963). Multiple magazines were loaded with PMC Bronze ammunition for firing with the CZ 75 P-07 firearm. After the ammunition was expended, the bullets were collected 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 marked with a "1" (three bullets), then sealed into their respective boxes.

ITEMS 2, 3, AND 5 (ELIMINATION): Items 2, 3, and 5 were discharged from a CZ 40B (SN: A6172). Multiple magazines were loaded with PMC Bronze ammunition for firing with the CZ 40B firearm. After the ammunition was expended, the bullets were collected together as a batch. This process was repeated until the required number was produced. From each batch, the necessary number of bullets was selected and marked with a “2” (one bullet), “3” (one bullet), and “5” (one bullet), then sealed into their respective boxes.

ITEM 4 (ELIMINATION): Item 4 was discharged from a Desert Eagle 40 S&W (SN: 31310885). Multiple magazines were loaded with PMC Bronze ammunition for firing with the Desert Eagle firearm. After the ammunition was expended, the bullets were collected together as a batch. This process was repeated until the required number was produced. From each batch, the necessary number of bullets was selected and marked with a “4” (one bullet), then sealed into their respective boxes.

SAMPLE SET ASSEMBLY: For each sample set, Items 2, 3, and 5 of the same elimination batch, along with an Item 1 and an Item 4 were placed into a pre-labeled sample set box.

VERIFICATION: During test production, 10% of the bullets from each batch were selected and intercompared to confirm that markings were consistent. All predistribution laboratories reported the expected responses.

Updated February 12, 2024:
After review of the full participant responses, CTS has determined that the assigned value for Items 2, 3, and 5 includes both elimination and inconclusive.

Summary Comments

This test was designed to allow participants to assess their proficiency in a comparison of expended bullets. Participants were provided with four questioned expended PMC Bronze .40 Smith & Wesson (S&W) 180 Grain FMJ-FP bullets (Items 2, 3, 4, and 5) and three known expended bullets (Item 1). Participants were requested to compare the Item 1 known bullets that were discharged from the suspect's firearm, a CZ 75 P-07 (SN: A758963) with the questioned Items 2-5 bullets. For each sample set, Items 2, 3, and 5 bullets were discharged from a second CZ brand firearm than that of the Item 1 known bullets and the Item 4 bullet was discharged from a third firearm of a different brand (Refer to Manufacturer's Information for preparation details.)

In Table 1 Examination Results, 219 of the 280 responding participants (78%) either eliminated or were inconclusive for Items 2, 3, 4 and 5 as having been discharged from the same gun as the Item 1 known bullets. Of the 61 remaining participants, 47 either eliminated or were inconclusive for Item 4 and identified Items 2, 3, and 5. Fourteen participants reported various combinations of eliminations or inconclusive results and identifications.

This test received a considerable amount of feedback regarding the quality of the expended known bullets in Item 1 and to a lesser extent the expended questioned bullets in Items 2, 3 and 5. Comments concerned several aspects such as the quality and the reproducibility of the marks/striae on the Item 1 known bullets as well as tank damage noted on both known and questioned bullets. After reviewing the data and responses, CTS acknowledges that this test was more challenging than originally intended. Many participants could not easily compare the questioned bullets in Items 2, 3 and 5 to the Item 1 known bullets and thus more inconclusive results were received than is generally seen in this type of test. Approximately, 100 participants were able to conclude that the questioned bullets in Items 2, 3 and 5 were fired from the same gun. Participants had more success in eliminating Item 4 (98.2%), as this bullet was discharged from a different brand of gun and displayed different class characteristics.

After review of the full participant responses, CTS has determined that the assigned value for Items 2, 3, and 5 includes both elimination and inconclusive.

Updated July 19, 2024:
Based on participant feedback and community interest, a Frequently Asked Questions document has been appended to the end of this report.

Examination Results

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

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
22848R	Inc	Inc	No	Inc	62PKRB	Inc	Inc	No	Inc
22MMRP	Yes	Yes	No	Yes	66AF8N	Yes	Yes	No	Yes
27FM97	Inc	Inc	No	Inc	6836ZG	Inc	Inc	No	Inc
298JXZ	Inc	Inc	No	Inc	68YMU7	Yes	Yes	No	Yes
29ZLDM	Yes	Yes	No	Yes	6APXX6	No	No	No	No
2EQZAA	Inc	Inc	No	Inc	6DN9U6	No	No	No	No
2H7GHE	Inc	Inc	No	Inc	6HGGT6	No	No	No	No
2RENK9	No	No	No	No	6VHZHJ	Yes	Yes	No	Yes
2TBEDA	Inc	Inc	No	Inc	6VLHPV	Inc	Inc	No	Inc
2XMCWP	Inc	Inc	No	Inc	6VQX2V	Inc	Inc	No	Inc
32EY64	Inc	Inc	No	Inc	6XAYWH	No	No	No	No
3EP9UE	Inc	Inc	No	Inc	73EAAU	Yes	Yes	No	Yes
3KQP4Y	No	No	No	No	73JPMV	No	No	No	No
3NFWPG	No	No	No	No	7679NT	No	No	No	Yes
3P7XRY	Yes	Yes	No	Yes	774GWC	Inc	Inc	No	Inc
3T2WXG	Yes	Yes	No	Yes	7A3TTC	No	No	No	No
3VTTLB	Yes	Yes	No	Yes	7CPABW	No	No	No	No
43N8TU	Inc	Inc	No	Yes	7DYGAJ	No	No	No	No
4AT876	Inc	Inc	No	Inc	7F63Y6	No	No	No	No
4CFNHY	No	No	No	No	7FPJE8	Inc	Inc	No	Inc
4Z68X9	No	No	No	No	7PUTLW	Inc	Inc	No	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
7UA2AW	Inc	Inc	No	Inc	A6ZT9X	No	No	No	No
7XPVN9	Inc	Inc	No	Inc	A83WUT	Yes	Yes	No	Yes
7ZAHHG	Inc	Inc	No	Yes	ALY7GY	Inc	Inc	No	Inc
7ZAR4L	Yes	Yes	No	Yes	AQFE6X	Inc	Inc	No	Inc
83XKH2	Yes	Yes	No	Yes	ARQDY8	Inc	Inc	No	Inc
86MK6C	No	No	No	No	ATK46L	No	No	No	No
89MT9M	No	No	No	No	B3LV7Z	No	No	No	No
8C72J9	Inc	Inc	No	Inc	B4DW8G	Yes	Yes	No	No
8FM9YU	Inc	Inc	No	Inc	B8WWDP	Inc	Inc	No	Inc
8RHCB2	Inc	Inc	No	Inc	BA3LDD	Inc	Inc	No	Inc
8U3D7M	Inc	Inc	No	Inc	BA7VLC	No	No	No	No
8WUAUG	No	No	No	No	BBFWQJ	Inc	Inc	No	Inc
8X2RTD	Inc	Inc	No	Inc	BCTNJ2	No	No	No	No
8XXAL2	No	No	No	No	BDN97Z	No	No	No	No
97UJEC	Inc	Inc	No	Inc	BEWJ34	Inc	Inc	No	Inc
984DAC	Yes	Yes	No	Yes	BGGEHG	Yes	Yes	No	Yes
98LHTA	No	No	No	No	BHH7XC	Yes	No	No	No
9EK6HP	Inc	Inc	No	Inc	BK7L6Y	No	No	No	No
9EPKVP	No	No	No	No	BKLV4R	No	No	No	No
9GC4WM	Yes	Yes		Yes	BKPEB3	No	No	No	No
9PM7HN	Inc	Inc	No	Inc	BM7U9A	Yes	Yes	No	Yes
A6BZ6Y	Inc	Inc	No	Inc	BM9F6P	No	No	No	No
A6FFHY	Inc	Inc	No	Inc	BWH8AD	Yes	Yes	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
BYPDXZ	Inc	Inc	No	Inc	EVA2MZ	Inc	Inc	No	Inc
BZWNJH	Yes	Yes	No	Yes	EWNQNR	Inc	Inc	No	Inc
BZXEXD	Inc	Inc	No	Inc	EYVNH9	Inc	Inc	No	Inc
CD2XAC	Inc	Inc	No	Inc	EZ9F94	No	No	No	No
CF48UE	Yes	Yes	No	Yes	F8HBH4	Inc	Inc	No	Inc
CJAGAQ	Yes	Yes	No	Yes	FA9CL7	Inc	Inc	No	Inc
CLUH6D	Yes	Yes	No	Yes	FGRJEW	Inc	Inc	No	Inc
CMTFML	Inc	Inc	No	Inc	FMY2MX	Inc	Inc	No	Inc
DEAR44	Inc	Inc	No	Inc	FP6KRK	No	No	No	No
DF4HAH	Inc	Inc	Inc	Inc	FQERQ8	No	No	No	No
DGEAGD	Inc	Inc	No	Inc	FR38XU	No	No	No	No
DGVGNF	Inc	Inc	No	Inc	FT6TWV	No	No	No	No
DN3X83	Inc	Inc	No	Inc	FXWZE4	No	No	No	No
DW822E	Inc	Inc	No	Inc	FY9QQT	Inc	Inc	No	Inc
DWAR3V	No	No	No	No	FZ2PGC	Inc	Inc	No	Inc
DZPABY	Inc	Inc	No	Inc	G6T4X7	Inc	Inc	No	Inc
E2JHWN	No	No	No	No	GA466V	Yes	Yes	No	Inc
E3C933	No	No	No	No	GHHZY6	Yes	Yes	No	Yes
EAP9D7	Yes	Yes	No	Yes	GQQQJV	Inc	Inc	No	Inc
EEUJ2U	Inc	Inc	No	Inc	GQUDZ9	Inc	Inc	No	Inc
EJ2A4Z	Inc	Inc	No	Inc	GUMJA6	Inc	Inc	No	Inc
EJGH8A	Yes	Yes	No	No	GV8ZRR	No	No	No	No
ETMJ6E	No	No	No	No	H2MB6J	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
H3JT3E	No	No	No	No	KYT6YD	No	No	No	No
H8972G	Yes	Yes	Inc	Yes	L2CFBN	No	No	No	No
H8DLEH	Inc	Inc	No	Inc	L6WEG7	Yes	No	No	Yes
HN6E8W	No	No	No	No	LB269C	Inc	Inc	No	Inc
HTRDDB	Inc	Inc	No	Inc	LCVX4V	Inc	Inc	No	Inc
J3FBV4	Inc	Inc	No	Inc	LDNNAA	No	No	No	No
J47MGU	Inc	Inc	No	Inc	LDPLK6	Yes	Yes	No	Yes
J4TXDH	Yes	Inc	No	Inc	LHGZZY	Yes	Yes	No	Yes
J68DVP	Inc	Inc	No	Inc	LMEDNP	No	No	No	No
J7T7HR	Inc	Inc	No	Inc	M329JC	No	No	No	No
J8RAB3	No	No	No	No	M3NTCQ	No	No	No	No
J92GEV	Inc	Inc	No	Inc	M7QG9F	Inc	Inc	No	Inc
JBLDUA	Inc	Inc	No	Inc	MBW8BL	Inc	Inc	No	Inc
JJP7JW	Inc	Inc	No	Inc	MG99FP	Inc	Inc	No	Inc
JJZ6K8	Inc	Inc	No	Inc	MGNGKJ	No	No	No	No
JZAWJV	No	No	No	No	MJQEVC	Inc	Inc	No	Inc
K3VX2P	Inc	Inc	No	Inc	MKJEMV	Yes	Yes	No	Yes
K4L9QW	Inc	Inc	No	Inc	MTCKMN	Inc	Inc	No	Inc
K6EYWB	No	No	No	No	MW2PJ3	Yes	Yes	No	Yes
KMW8NY	Yes	Yes	No	Yes	MWFBVP	No	No	No	No
KMZM77	Inc	Inc	No	Inc	MXTVVL	No	No	No	No
KPN4DT	Yes	Yes	Inc	Yes	MY98KJ	No	No	No	No
KW4MV8	Yes	Yes	No	Yes	N4UKWQ	Inc	Inc	No	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
N7EFC4	Yes	Yes	No	Yes	R396W7	Inc	Inc	No	Inc
N8F7QY	Inc	Inc	No	Yes	R6WL9Z	Yes	Yes	No	Yes
NCA4E6	Inc	Inc	No	Inc	R83TRR	Inc	Inc	No	Inc
NCPJ7C	No	No	No	No	R8NDK7	Inc	Inc	No	Inc
NPELP6	Inc	Inc	No	Inc	RACUWY	Inc	Inc	No	Inc
NRZ48P	Inc	Inc	No	Inc	RFTKZ7	No	No	No	No
NY2KFA	No	No	No	No	RJVFRL	No	No	No	No
P93Z6E	Inc	Inc	No	Inc	RUEVUN	Inc	Inc	No	Inc
PAWQBU	No	No	No	No	T34PJ7	Inc	Inc	No	Inc
PAWZWY	Yes	Yes	No	Yes	T7JJXH	No	No	No	No
PC7VPH	No	No	No	No	T7NYBH	No	No	No	No
PCM2Z2	Inc	Inc	No	Inc	TA48YH	Inc	Inc	No	Inc
PDEBVN	Inc	Inc	No	Inc	TDN3EV	No	No	No	No
PFHT9X	Yes	Yes	No	Yes	TE3LL8	Inc	Inc	No	Inc
PNYJFB	Yes	Yes	No	Yes	TJTVV7	Inc	Inc	No	Inc
PQ3DEF	No	No	No	No	TK7P8Y	Inc	Inc	No	Inc
Q6X4NJ	Yes	No	No	No	TKNFH6	Inc	Inc	No	Inc
Q8QM2H	No	No	No	No	TMCWQR	Yes	Yes	No	Yes
QAUPFL	Yes	Yes	No	Yes	TPFRCF	Yes	Yes	No	Yes
QBMCHP	Inc	Inc	No	Inc	TQTEUU	Inc	Inc	No	Inc
QGRBTF	No	No	No	No	TYNGV7	Yes	Yes	No	Yes
QJHJRH	Yes	No	No	Yes	UEAACW	Inc	Inc	No	Inc
QMFVWV	No	No	No	No	UG2J8J	Inc	Inc	No	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
UGMWVW	Inc	Inc	No	Inc	WP7XCH	Inc	Inc	No	Inc
UHUADY	Inc	Inc	No	Inc	WQWFXQ	Yes	Yes	No	Yes
UKM63T	Inc	Inc	No	Inc	WRBVDD	Inc	Inc	No	Inc
ULD87V	No	No	No	No	WT3Q38	Yes	Yes	No	Yes
ULGQVJ	Inc	Inc	No	Inc	X9VLCC	No	No	No	No
UNMCL6	Inc	Inc	No	Inc	XAR2MN	Inc	Inc	No	Inc
UNPWGK	No	No	No	No	XBMU7E	Inc	Inc	No	Inc
UQATWX	Yes	Yes	No	Yes	XE43UD	Inc	Inc	No	Inc
UUMVJU	No	No	No	No	XMVMPD	No	No	No	No
UV6HHC	No	No	No	No	XTNHXD	Inc	Inc	No	Inc
VERQTC	No	No	No	No	XUWQTQ	Inc	Inc	No	Inc
VFJP7A	No	No	No	No	XWKBM2	Inc	Inc	No	Inc
VHBNK9	No	No	No	No	XXDBDK	Inc	Inc	No	Inc
VHTPCG	No	No	No	No	XY683E	Yes	Yes	No	Yes
VPB8KH	Inc	Inc	No	Inc	XZ4BZW	Inc	Inc	No	Inc
VPBXZD	Inc	Inc	No	Inc	Y2CTKD	Inc	Inc	No	Inc
VVYUD3	No	No	No	No	Y33A6L	Yes	Yes	No	Yes
WCG98K	No	No	No	No	Y8JBTE	Inc	Inc	No	Inc
WD8HVT	Yes	Yes	Yes	No	Y8XVJ3	Inc	Inc	No	Inc
WE8ABN	Inc	Inc	No	Inc	YNKFX3	No	No	No	No
WKPRJP	Inc	Inc	No	Inc	YR63Y3	Inc	Inc	No	Inc
WNCJGD	Inc	Inc	No	Inc	YTEAWN	Yes	Yes	No	Yes
WP4F78	No	No	No	No	YTZNL2	Inc	Inc	No	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
YV79BM	No	No	No	No					
YZLU7F	No	No	No	No					
ZDLTUC	Inc	Inc	No	Inc					
ZQUKDB	Inc	Inc	No	Inc					
ZTEJHT	Yes	Yes	No	Yes					
ZU8KA3	Yes	Inc	No	Inc					
ZVZBFG	No	No	No	No					
ZWQL6P	Inc	Inc	No	Inc					

Response Summary

Participants: **280**

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

Responses	Item 2	Item 3	Item 4	Item 5
Yes	**57** ***(20.4%)***	**51** ***(18.2%)***	**1** ***(0.4%)***	**53** ***(18.9%)***
No	**88** ***(31.4%)***	**92** ***(32.9%)***	**275** ***(98.2%)***	**92** ***(32.9%)***
Inc	**135** ***(48.2%)***	**137** ***(48.9%)***	**3** ***(1.1%)***	**135** ***(48.2%)***

** After review of the full participants' responses, CTS has determined that the assigned value for Items 2, 3, and 5 includes both elimination and inconclusive.*

Conclusions

TABLE 2

WebCode	Conclusions
22848R	The three reference bullets of item 1 were mutually compared. The bullets show nearly no useable striation markings. Bullet item 4 shows difference in class characteristics with item 1 and could therefore not have been fired from it. Bullets items 2, 3 and 5 show agreement in class characteristics with the bullets from firearm item 1. Moderate to good agreement was found between the striation lines on items 2, 3 and 5: there are indications that these three bullets were fired from the same barrel. However, the same agreement was not found in comparison with the reference bullets from item 1. Given the low presence and reproducibility of striation markings on the reference items 1, it can, however, not be excluded nor can it be confirmed that item 1 was used to fire items 2, 3 and 5.
22MMRP	1 - All bullets cases items (1,2,3,4 and 5) are .40S&W . 2 - Items (2.3.5) discharged from suspect's weapon. 3 - Item 4 discharged from same weapon but not discharged from suspect's weapon. 4 - Item 4 discharged from different weapon and not discharged from suspect's weapon.
27FM97	1. Examination of Exhibit 1 revealed it contains three (3) fired bullets normally loaded into a .40 caliber cartridge. This Exhibit was submitted by the provider (CTS) as test fires from a CZ 75 P-07 pistol. a. Exhibit 1 test fires are suitable for microscopic comparison. Visible damage observed on some areas of the bearing surface, and ogive of the test fires. b. Exhibit 1 displays six (6) land and grooves with a right hand twist. 2. Examination of Exhibits 2 through 5 revealed each contains one (1) fired bullet normally loaded into a .40 caliber cartridge. Exhibits 2 through 5 are suitable for microscopic comparison. Damaged observed on ogive and some areas of bearing surface. 3. Microscopic comparison of Exhibits 1 through 5 revealed: a. Exhibits 2, 3, and 5 were fired from the same firearm due to sufficient agreement of individual characteristics. i. Exhibits 2, 3, and 5 were fired by a firearm displaying six (6) land and grooves with a right hand twist. ii. Possible firearms that could have fired Exhibits 2, 3, and 5 include Ceska Zbrojovka (CZ), Kriss USA, Sigarms. This list is not all inclusive; any suspect firearms should be submitted for microscopic comparison. b. Exhibit 4 was fired by a firearm displaying six (6) land and grooves with a right hand twist. i. Exhibit 4 was not fired by the same firearm as Exhibits 2, 3, and 5 due to disagreement of class characteristics; Exhibits 2, 3, and 5 (conventional rifling) versus Exhibit 4 (polygonal rifling). ii. Exhibit 4 was not fired by the same firearm as Exhibit 1 due to disagreement of class characteristics; Exhibit 1 (conventional rifling) versus Exhibit 4 (polygonal rifling). iii. Possible firearms that could have fired Exhibit 4 include IMI, Bersa, Glock, Heckler & Koch or Vektor. This list is not all inclusive; any suspect firearms should be submitted for microscopic comparison. c. It could not be determined if Exhibits 2, 3, and 5 were fired by the same firearm as Exhibit 1 due to insufficient agreement/disagreement of individual characteristics.
298JXZ	The submitted fired bullets (Items 2, 3, and 5) were neither identified nor eliminated as having been fired from the submitted CZ model 75 P-07 pistol due to the lack of unique and reproduced individual marks. The submitted fired bullets (Items 2, 3, and 5) were identified as having been fired from the same unknown firearm. The submitted fired bullets (Items 2, 3, and 5) were consistent with 40/10mm caliber class and were fired from a firearm with 6 L&G rifling with a right (clockwise) twist. A list of firearm makes/models that could have potentially fired Items 2, 3, and 5 was generated by a 2021 [Laboratory] Database search and includes but is not limited to: Smith & Wesson and Beretta. The submitted fired bullet (Item 4) was eliminated as having been fired from the submitted CZ model 75 P-07 pistol. The submitted fired bullet (Item 4) was eliminated as having been fired from the same unknown firearm as the submitted

TABLE 2

WebCode	Conclusions
	fired bullets (Items 2, 3, and 5). The submitted fired bullet (Item 4) was consistent with 40/10mm caliber class and was fired from a firearm with 6 L&G polygonal rifling with a right clockwise twist. A list of firearm manufacturers and models that could have potentially fired Item 4 generated by a 2021 [Laboratory] Database search includes but is not limited to: Glock and Heckler & Koch.
29ZLDM	The projectiles identified as ITEMS 2, 3 and 5 were fired by the same firearm that fired the Pattern projectiles and designated as ITEM No 1, therefore they were fired by the firearm type pistol of brand CZ model 75 P-07, calibrer .40 S&W The projectile identified as ITEM No. 4 was fired by a different firearm than the one that fired the standard projectiles and designated as ITEM No. 1. Therefore, ITEM No. 4 was not fired by the firearm type pistol of brand CZ model 75 P-07, calibrer .40 S&W
2EQZAA	The Item 2, 3, and 5 bullets were microscopically identified as having been fired in the same unknown firearm. The bullets were determined to be of 40/10mm caliber, displaying rifling characteristics of 6 lands and grooves, right twist. Manufacturers of firearms displaying similar rifling characteristics include, but are not limited to: Beretta, CZ, Iberia Arms, KSN Industries, Sigarms, Smith & Wesson, Steyr, and Taurus. The Item 2, 3, and 5 bullets display similar class characteristics as the Item 1 test fires; however, differences in individual characteristics suggest that another firearm was used. The Item 4 bullet was not fired from the same firearm as the Item 1 test fires, nor from the same firearm as Items 2, 3, and 5. Item 4 was determined to be of 40/10mm caliber, displaying polygonal rifling characteristics of 6 lands and grooves, right twist. Manufacturers of firearms displaying similar rifling characteristics include, but are not limited to: Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor.
2H7GHE	Examinations showed Item 4 was not discharged from the same firearm as Item 1. Examinations to determine if Items 2, Item 3 and Item 5 were discharged from the same firearm as Item 1 were inconclusive.
2RENK9	Physical and microscopic examinations and comparisons were conducted of all the submitted evidence and the test firings. Based on those examinations and comparisons, it is my opinion that: a. The items 1-2, 1-3, and 1-5 spent projectiles were fired from the same unknown weapon capable of chambering and firing .40 caliber class ammunition and employing a rifling system consisting of six (6) lands and grooves with a right twist. “Identification” b. The items 1-2, 1-3, and 1-5 spent projectiles were not fired from the suspect’s weapon that produced the item 1-1 test fires. “Exclusion” c. The item 1-4 spent projectile was fired from an unknown weapon capable of chambering and firing .40 caliber class ammunition to exclude the suspect’s weapon that produced the item 1-1 test fires and the unknown weapon that fired the items 1-2, 1-3, and 1-5 spent projectiles. “Exclusion”
2TBEDA	The evidence bullets, CTS Items 2 through 5, were compared to the test-fired bullets, CTS Item 1, using a comparison microscope. Based on the examination, it is my opinion that the results for the comparison of CTS Item 1 to CTS Items 2, 3 and 5, were inconclusive, there was agreement of discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Based on the examination, CTS Item 4 was eliminated as being fired in the firearm that fired CTS Item 1. There were significant disagreement of discernible class characteristics and/or individual characteristics to conclude that the bullets were fired from different firearms.
2XMCWP	Items 2, 3, 4, & 5 were microscopically compared with the following results. Item 4 was eliminated as being fired from the same firearm as items 2, 3, & 5 due to a difference in rifling type. Items 2, 3, & 5 are inconclusive to each other. Although there is agreement in class

TABLE 2

WebCode	Conclusions
	characteristics there is a lack of agreement or disagreement for a conclusive result. Items 2, 3, 4, & 5 were microscopically compared to the test standards from the submitted firearm with the following results. Item 4 was eliminated as being fired from the submitted firearm due to a difference in rifling type. Items 2, 3, & 5 are inconclusive to the test standards. Although there is agreement in class characteristics there is a lack of agreement or disagreement for a conclusive result
32EY64	Not enough characteristics were observed on the Item2, Item3 and Item 5 for the conclusion that them were discharged from the firearms discharged Item 1 (Inconclusive). Item 4 was not discharged from the firearm discharged Item 1 (different class characteristics)
3EP9UE	The test fired bullets marked #1 were examined and microscopically compared to the bullets marked #2, #3 and #5. The results of the comparisons were inconclusive. The test fired bullets marked #1 and the bullets marked #2, 3 and #5 were examined and microscopically compared to the bullet marked #4. The bullets were eliminated as having been discharged in the same unknown pistol as the bullet marked #4. The bullet marked #2 and the bullet marked #3 were examined and microscopically compared to each other with positive (identification) results. The bullets marked #2 and #3 were discharged in the same unknown firearm.
3KQP4Y	From the firing marks present and fine detail within we are of the opinion that bullets 2,3,4 and 5 have not been fired from the recovered weapon. From the firing marks present in items 2 and 5, and the fine detail within, we are of the opinion that these two bullets have been fired from the same weapon.
3NFWPG	1. The bullet marked E-1 to E-3 (Item 1), corresponding to piece 1, are .40/10mm caliber, with rifling to the right (R-6) and were fired by a same firearm (identification). [Initials] November/9/2023 2. The bullet marked E-4 (Item 2), E-5 (Item 3) and E-6 (Item 5), corresponding to piece 1, are .40/10mm caliber, with rifling to the right (R-6) and were fired by the same firearm (identification). [Initials] November/9/2023 3. The bullet marked E-7 (Item 4), corresponding to piece 1, is .40/10mm caliber, with rifling to the right (R-6) and was fired from a firearm. [Initials] November/9/2023
3P7XRY	The three (3) bullets (item 1) test fired from the suspect's firearm were compared among themselves and I found that they bore sufficient agreement of discernible class characteristics and sufficient agreement individual characteristics. One (1) of the bullets (item 1) test fired from the suspects firearm was then compared to each of the four (4) bullets, items 2, 3, 4 and 5 recovered from the crime scene and I found that: 1. The three (3) bullets, items 2, 3 and 5 were identified as having been fired from the suspect's firearm based on the agreement of all discernible class characteristics and sufficient agreement of individual characteristics with the bullets test fired from the suspects firearm (item 1). 2. The bullet, item 4 was eliminated as having been fired from the suspect's firearm based on the disagreement of discernable class characteristics with the bullets test fired from the suspects firearm (item 1). This bullet, items 4, was fired from another/unknown firearm.
3T2WXG	Four(4) bullet Frogments obtained from the crime scene; it ıs divided in to two grups (3-1). the three (3) bullets that come out of the box numbered ıtem 2, ıtem 3 and ıtem 5 ore compotible with the comporis ans in the box numbered ıtem 1 of the gun in guestion and these bullets were fined with the gun. The bullet of the biru bullet coming out of the box numbered ıtem 4 is wool-free and was not fired with the weapan in question.
3VTTLB	After microscopic comparison, it was determined that Case #23-5262, Items #2, 3, and 5, three (3) recovered spent projectiles, WERE FIRED from the subject CZ 75 P-07 firearm based

TABLE 2

WebCode	Conclusions
	on sufficient agreement of class and individual characteristics. There is sufficient quality and quantity of the consecutive matching striations for an identification. After microscopic examination, it was determined that Case #23-5262, Item #4, one (1) recovered spent projectile, WAS NOT FIRED from the CZ 75 P-07 firearm based on disagreement of class characteristics. The subject spent projectile exhibits class characteristics of a polygonal barrel, inconsistent with the traditional cut barrel of the subject CZ 75 P-07 firearm.
43N8TU	Items 2-5 each consisted of one fired bullet in .40" S&W calibre. Microscopic comparison was conducted on Item 2 against the test fired bullet in Item 1 but the result was inconclusive. Microscopic comparison was conducted on Item 3 against the test fired bullet in Item 1 but the result was inconclusive. Microscopic comparison was conducted on Item 4 against the test fired bullet in Item 1 which showed that they were not discharged from the same firearm. Microscopic comparison was conducted on Item 5 against the test fired bullet in Item 1 which showed that they were discharged from the same firearm.
4AT876	1) Exhibit 1 (Three .40 Bullets) was physically examined and microscopically compared to Exhibits 2 (One .40 Bullet), 3 (One .40 Bullet), 4 (One .40 Bullet), and 5 (One .40 Bullet). a) The Exhibits 2, 3, and 5 bullets were fired from the same firearm based on a sufficient agreement of individual characteristics. b) It could not be determined if the Exhibit 1 bullets were or were not fired from the same firearm as the Exhibits 2, 3, and 5 bullets based on an insufficient agreement or disagreement of individual characteristics. c) The Exhibit 4 bullet was not fired from the same firearm as the Exhibit 1 bullets or the Exhibits 2, 3, and 5 bullets based on a disagreement of discernible class characteristics.
4CFNHY	1) Examinations showed Item 2, Item 3, Item 4 and Item 5 to be four (4) discharged and mutilated jacketed bullets of the .40 /10mm caliber class. 2) A microscopic examination showed Item 2, Item 3 and Item 5 to be three (3) bullets that were discharged from a firearm having six (6) lands and grooves with a right hand conventional rifling twist. A microscopic comparison showed that Item 2, Item 3 and Item 5 were discharged from the same unknown firearm. 3) A microscopic examination showed Item 4 to be one (1) bullet that was discharged from a firearm having six (6) land and grooves with a right hand polygonal rifling twist. A microscopic comparison showed that Item 4 was not discharged from the same unknown firearm which discharged Item 2, Item 3 and Item 5 but from a second unknown firearm. This elimination was due to sufficient differences in class characteristics. 4) A microscopic comparison was conducted comparing the bullets listed as Item 2, Item 3, Item 4 and Item 5 to the three (3) test fired bullets obtained from the firearm listed as Item 1: CZ-75 / P-07 pistol in .40 S&W. 5) The results of the microscopic comparison showed that the bullets listed as Item 2, Item 3 and Item 5 were not discharged from the firearm listed as Item 1. This elimination was due to sufficient differences in individual characteristics. 6) The results of the microscopic comparison showed that the bullet listed as Item 4 was not discharged from the firearm listed as Item 1. This elimination was due to sufficient differences in class characteristics.
4Z68X9	Items 2, 3, 5 The bullets were all microscopically identified as having been fired from the same firearm, but a different firearm than the Item 1 firearm. The bullets were determined to be of 40/10mm caliber displaying conventional rifling characteristics of six lands and grooves, right twist. Manufacturers of firearms with similar rifling characteristics include, but are not limited to Beretta, CZ, Heritage, KSN Industries, Republic Arms, SigArms, Smith and Wesson, Springfield Inc., Steyr, Taurus and TNW Incorporated. Item 4 The bullet was not fired from the same firearm as Items 2, 3, and 5 nor the firearm that fired Item/s 1. The bullet was determined to be of 40/10mm caliber displaying polygonal rifling characteristics of six lands and grooves, right twist. Manufacturers of firearms with similar rifling characteristics include, but are not

TABLE 2

WebCode	Conclusions
	limited to Bersa, Glock, Heckler and Koch, IMI, Kahr Arms and Vektor.
62PKRB	EXAMINATIONS SHOWED ITEM 4 (R-3) WAS NOT DISCHARGED FROM THE CZ 75 P-07. EXAMINATIONS SHOWED ITEMS 2 (R-1), 3 (R-2) AND 5 (R-4) WERE DISCHARGED FROM THE SAME UNKNOWN FIREARM. EXAMINATIONS TO DETERMINE IF ITEMS 2 (R-1), 3 (R-2) AND 5 (R-4) WERE DISCHARGED FROM THE CZ 75 P-07 WERE INCONCLUSIVE DUE TO LACK OF AGREEMENT OR DISAGREEMENT OF INDIVIDUAL CHARACTERISTICS AND MUTILATION.
66AF8N	The projectiles of item 2, 3 and 5 were fired by the same firearm as item 1, the projectile 4 was not fired by the same firearm; that is, there are two firearms.
6836ZG	The questioned recovered bullet identified "4" was not discharged from the same firearm as the known test-fired bullets ("1") - The firearm as the known test-fired bullets ("1") can not be matched or mismatched with the questioned recovered bullets identified "2", "3" and "5".
68YMU7	The bullets from items 2, 3 and 5 were fired from the same firearm (CZ 75 P-07) as the bullets from item 1. Only the bullet from item 4 was fired from another firearm with a polygonal barrel. This firearm could be a Glock Model 23 semi-automatic pistol or another firearm not listed in our database.
6APXX6	The Item 2, 3 and 5 bullets were identified, within the limits of practical certainty1, as having been fired by the same firearm. They were not fired by the recovered firearm that was used to generate the Item 1 test fired bullets. The Item 4 bullet was not fired by the same firearm as Items 2, 3 and 5 or by the recovered firearm that was used to generate the Item 1 test fired bullets.
6DN9U6	[No Conclusions Reported.]
6HGGT6	Items 2, 3, 4, and 5 (bullets) were microscopically compared to test fired bullets from Item 1 (firearm). Because of differences observed in class or individual characteristics, Items 2, 3, 4, and 5 were eliminated as having been fired from Item 1 (firearm).
6VHZHJ	las balas 2, 3, y 5 fueron disparadas por el arma de fuego, el indicio 4 fue disparada por otra arma de fuego distinta a los testigos obtenidos. [Translation not provided at time of publication.]
6VLHPV	CTS Items 2, 3, and 5 bullets were fired by one firearm. These items can neither be eliminated nor identified as having been fired by the firearm said to have created CTS Item 1 bullets based on a lack of agreeing individual characteristics; however, available class characteristics are similar. CTS Items 2, 3, and 5 are consistent with bullets commonly found loaded in some 40 S&W/10mm Auto caliber cartridges. 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. CTS Item 4 bullet is consistent with bullets commonly found loaded in some 40 S&W/10mm Auto caliber cartridges. This item was not fired by the firearm(s) that fired CTS Items 1, 2, 3, and 5. No list of possible firearm manufacturers/origins was generated due to poor rifling engagement and/or rifling type.
6VQX2V	The fired bullet, 1-4, was eliminated from having been fired from the CZ pistol (test fires 1-1), as well as the same firearm that fired bullets 1-2, 1-3 & 1-5, based on differences in class characteristics. The three fired bullets, 1-2, 1-3 & 1-5, were identified and having been fired from the same firearm; however, due to agreement in class and some individual characteristics, but and overall lack of consistent and reproducible marks observed, the comparison of the bullets, 1-2, 1-3 & 1-5, to test fires, 1-1, was inconclusive.

TABLE 2

WebCode	Conclusions
6XAYWH	The three fired bullets(Item 1) were microscopically compared to each other and to the fired bullets(Item 2, 3, 4 and 5). Based on a disagreement of individual characteristics, Item 2, 3, 4 and 5 were not fired from the same firearm as Item 1.
73EAAU	The three (3) recovered questioned bullets, Items 2, 3 and 5 were discharged from the same firearm as the known test-fired bullets, Item 1. The recovered questioned bullet, Item 4 was discharged from a different firearm.
73JPMV	The four bullets (Item 2 – Item 5) were eliminated as being fired from the CZ model 75 P-07 pistol (represented by test fired bullets Item 1). The three bullets (Item 2, Item 3, Item 5) were identified as being fired from the same unknown firearm. The bullet (Item 4) was eliminated as being fired from the same unknown firearm as the three bullets (Item 2, Item 3, Item 5). The three bullets (Item 2, Item 3, Item 5) are consistent with 40 caliber class and were fired from a firearm with six conventionally rifled lands and grooves with a right twist. Possible firearms from which the three bullets (Item 2, Item 3, Item 5) may have been fired from include, but are not limited to, 40 caliber class firearms marketed by Beretta, CZ, Sig Sauer, Smith & Wesson, and Taurus among other firearms not commonly encountered in this laboratory. The bullet (Item 4) is consistent with 40 caliber class and was fired from a firearm with six polygonal rifled lands and grooves with a right twist. Possible firearms from which the bullet (Item 4) may have been fired from include, but are not limited to, 40 caliber class firearms marketed by Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vector.
7679NT	I microscopically compared Items 1A through 1C to Item 5. I identified Item 5 as being fired in the same firearm as Items 1A through 1C based on sufficient agreement of individual characteristics within the land impressions. I microscopically compared Items 1A through 1C to Items 2 and 3. Items 2 and 3 can be eliminated from being fired in the same firearm as Items 1A through 1C based on significant differences of individual characteristics within the land impressions. I microscopically compared Item 2 to Item 3. I identified Items 2 and 3 as being fired in a second firearm based on sufficient agreement of individual characteristics within the land impressions. I microscopically compared Items 1A through 1C, 2 and 3 to Item 4. Item 4 can be eliminated from being fired in the same firearm as Items 1A through 1C, 2, and 3 based on different class characteristics (cut rifling vs polygonal rifling). Item 4 was fired in a third firearm.
774GWC	It was not possible to find if any of the recovered bullets (Items 2, 3 and 5) were fired from the same firearm as the known test-fired bullets (Item 1), or if they were fired by another firearm wich imprint same class characteristics. Bullet Item 4 was not fired by the same firearm as the known test-fired bullets Item 1.
7A3TTC	Item 1 contains three (3) test fired 40 S&W caliber bullets with six land and groove impressions and right twist. Based on the agreement of class characteristics, these items were microscopically compared. The bullets from Item 1 were identified as having been fired from the same firearm based on the sufficient agreement of individual characteristics. Items 2, 3, and 5 are three (3) fired 40 S&W caliber bullets with six land and groove impressions and right twist. Based on the agreement of class characteristics, these items were microscopically compared. Items 2, 3, and 5 were identified as having been fired in the same unknown firearm based on the sufficient agreement of individual characteristics. Based on the agreement of class characteristics, Item 2 was microscopically compared to test fired bullets from Item 1. Item 2 could not have been fired from the same firearm as the bullets from Item 1 due to the significant disagreement of individual characteristics. Item 4 is one (1) fired 40 S&W caliber bullet with six land and groove impressions, right twist, and polygonal rifling. Item 4 could not

TABLE 2

WebCode	Conclusions
	have been fired from the same firearm as Item 1, or from the same unknown firearm as Items 2, 3, and 5 due to the significant disagreement of class characteristics.
7CPABW	Items 2, 3, 4 and 5 were not fired in the same firearm as the item 1 test fires. Items 2, 3 and 5 were fired in a second firearm. Items 2, 3, and 5 are consistent with bullets from ammunition designated 40 Smith and Wesson. A list of makes of firearms that may have fired these items includes, but is not limited to: Beretta, Ceska Zbrojovka, Czechoslovakia, FN/Browning, Heritage, Iberia Arms, KSN Industries, Sigarms, Smith and Wesson and Taurus. Item 4 was fired in a third firearm. Item 4 is consistent with bullets from ammunition designated 40 Smith and Wesson or 10mm Auto. A list of makes of firearms that may have fired this items includes, but is not limited to: Bersa, Glock, Heckler & Koch, IMI, Kahr Arms and Vektor.
7DYGAJ	Item #1 vs. Item(s) #2, #3, #4, #5 - Eliminated Compared the bullet Item #1 against the four bullet Items #2, #3, #4, #5. The bullet Item #1 and the four bullet Items #2, #3, #4, #5 were ELIMINATED as having been discharged from the same firearm.
7F63Y6	Item 1: Seven fired copper full metal jacketed bullets, labeled 1A-1G Bullets, Lab Items 1A, 1B, and 1C, were identified to the same unknown firearm Bullets, Lab Items 1D, 1E, and 1G, were identified to the same unknown firearm Bullet, Lab Item 1F, was excluded as having been fired from the same unknown firearm that fired Lab Items 1A-1C, as well as the same unknown firearm that fired Lab Items 1D, 1E and 1G. Bullets, Lab Item 1A-1G, are consistent in physical design and construction with 40 S&W caliber full metal jacket bullets.
7FPJE8	Caliber Determination Results: The Item 1A bullet was determined to be caliber 40 (10mm) Class. The Item 1B bullet was determined to be caliber 40 (10mm) Class. The Item 1C bullet was determined to be caliber 40 (10mm) Class. The Item 2 bullet was determined to be caliber 40 (10mm) Class. The Item 3 bullet was determined to be caliber 40 (10mm) Class. The Item 4 bullet was determined to be caliber 40 (10mm) Class. The Item 5 bullet was determined to be caliber 40 (10mm) Class. Comparison Results: The Items 1, 2, 3, and 5 bullets were fired by different firearm(s) than the Item 4 bullet. There is agreement of all discernible class characteristics and possible individual characteristics between the Item 1 bullets. However, the potential for subclass carryover could not be eliminated. Therefore, the Item 1 bullets were either fired by the same firearm, or by different firearm(s) manufactured with the same tool in the same approximate state of wear. There is agreement of all discernible class characteristics between the Item 1 bullets and the Items 2, 3, and 5 bullets; however, the comparison of individual characteristics was inconclusive. Therefore, the Items 2, 3, and 5 bullets could not be identified or eliminated as having been fired by the same firearm(s) or the same firearm(s) as the Item 1 bullets. Methodology The following methodologies were used in the examination of this case: Visual Examination, Physical Examination, Physical Measurements, Microscopic Examination, Microscopic Comparison.
7PUTLW	The Item A1-1 fired bullets are consistent in class characteristics with the Items A1-2, A1-3 and A1-5 submitted bullets. The Item A1-4 fired bullet is not consistent in class characteristics with the Items A1-1, A1-2, A1-3 and A1-5 submitted bullets. Item A1-1 was compared to items A1-2, A1-3 and A1-5. Examination revealed that the Item A1-1 bullets exhibit similar discernable class characteristics as the Items A1-2, A1-3 and A1-5 bullets; however, due to the lack of sufficient suitable corresponding microscopic markings, it was not possible to identify or eliminate these bullets as having been fired from the same firearm.
7UA2AW	Items 1, 2, 3, and 5 were inconclusive (II) to each other. Item 4 was eliminated as having been fired by the same firearm(s) that fired Items 1, 2, 3, and 5. This elimination is based on differences in class characteristics. The difference being the rifling type.

TABLE 2

WebCode	Conclusions
7XPVN9	The fired bullets in Submission #1a were microscopically compared and identified as having been fired from the same unknown firearm based on sufficient agreement in individual characteristics present to conclude an identification. The fired bullets in Submissions ##1b, #1c and #1d were microscopically compared and identified as having been fired from the same unknown firearm based on sufficient agreement in individual characteristics present to conclude an identification. The fired bullets in Submissions ##1b, #1c and #1d were microscopically compared to the bullets in Submission #1a and were unable to be identified or eliminated as having been fired from the same unknown firearm based on insufficient individual characteristics present. The fired bullet in Submission #1d was microscopically compared to all the other fired bullets and eliminated as having been fired from the same unknown firearm based on different class characteristics present.
7ZAHHG	[No Conclusions Reported.]
7ZAR4L	After doing the comparative study, it was determined that items 2, 3 and 5 have the same class characteristics and enough individual characteristics to establish identity with the standard projectiles. The above indicates that items 2, 3 and 5 were fired by the suspect firearm.
83XKH2	Con base a la inspeccion realizada se llego a las siguientes conclusiones Primera.- Las balas recuperadas de la escena del crimen identificadas con los numeros 2, 3 y 5 respectivamente, si fueron disparadas por el arma de fuego CZ 75 P-07, que se le confiscó ese mismo dia a una persona sospechosa. Segundo. La bala recuperada de la escena del crimen identificada con el numero 4, no fue disparada por el arma de fuego CZ 75 P-07, que se le confiscó ese mismo dia a una persona sospechosa. [Translation not provided at time of publication.]
86MK6C	1. The bullets marked E-1 to E-3 (Item 1), are caliber .40/10mm, with rifling to the right (R-6), were fired by the same firearm (Identification). 2. The bullets marked E-4 (Item 2), E-5 (Item 3) and E-7 (Item 5), are caliber .40/10mm, with rifling to the right (R-6), were fired by the same firearm (Identification). 3. The bullets marked E-6 (Item 4), is caliber .40/10mm, with rifling to the right (R-6), was fired by firearm.
89MT9M	Comparative examinations of Items 2, 3, 4 & 5 (four bullets) against Item 1 (known test-fired bullets) show the presence of different features. This means that Item 1 did not fire Items 2, 3, 4 & 5. Comparative examinations of Items 2, 3 & 5 showed the presence of corresponding features. This means that Items 2, 3 & 5 are consistent with having been fired from the same firearm. * Comparative examinations of Item 4 against Items 2, 3 & 5 showed the presence of different features. This means that Item 4 and Items 2, 3 & 5 were fired from different firearms. *Source identification is reached when the discernible class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source.
8C72J9	Based on differences in class characteristics, it was determined that submission 001-3 (item 4) was eliminated as originating from the same source that fired submissions 001-1 (item 2), 001-2 (item 3), and 001-4 (item 5) (source exclusion). Submissions 001-1, 001-2, and 001-4 were microscopically compared. Submissions 001-1, 001-2, and 001-4 exhibit the same general rifling class characteristics; however the results of microscopic comparisons were inconclusive due to damage and lack of detail of individual corresponding microscopic markings. It was not possible to identify or eliminate submissions 001-1, 001-2, and 001-4 as originating from the same source. Based on differences in class characteristics, it was determined that submission 001-3 was eliminated as having been fired from the same source that fired submission 001-5 (item 1) test fires produced by CTS in a CZ, model 75 P-07 firearm (source exclusion). Submissions 001-1, 001-2, 001-4, and 001-5 test fires were

TABLE 2

WebCode	Conclusions
	microscopically compared. Submissions 001-1, 001-2, and 001-4 exhibit the same general rifling class characteristics as submission 001-5 test fires; however the results of the microscopic comparisons were inconclusive due to damage and lack of detail of individual corresponding microscopic markings. It was not possible to identify or eliminate submissions 001-1, 001-2, and 001-4 as originating from the same source that fired submission 001-5 test fires, produced by CTS in a CZ, model 75 P-07 firearm.
8FM9YU	Items 2, 3 and 5 were inconclusive to Item 1 and one another. Item 4 was eliminated as having been fired by the same firearm(s) as Items 1, 2, 3 and 5. This elimination is based on differences in class characteristics. The difference being the rifling type.
8RHCB2	Items 2, 3 and 5 can neither be identified nor eliminated as having been fired in the same firearm as the Item 1 agency generated test fired bullets. Items 2, 3 and 5 were identified, within the limits of practical certainty1, as having been fired by the same firearm. Item 4 can be eliminated as having been fired by the same firearm(s) as Items 1, 2, 3 and 5.
8U3D7M	All bullets items 1 to 5 have a sloping surface with abrasions in the front area. These could have been caused by a mismatched silencer or by hitting or penetrating a target. There are some adhesions. The three reference bullets Item 1 have a very low trace intensity. The few individual traces present do not recur in a stable manner on the three bullets Item 1. The bullet Item 4 has a different surface profile than the bullets Item 1. This bullet may have been fired from a weapon with a polygonal barrel profile. Due to the lack of correspondence between the system traces, it can be ruled out that this bullet was fired from the same weapon as the bullets item 1. The bullets items 2, 3 and 5 also show weak individual traces, although some traces are stably recurring on the three bullets. Therefore, the statement can be made here that these bullets were fired from one and the same weapon. Due to the overall weak individual marks and the finding that the bullets show extraneous marks that could possibly have been caused by hitting or penetrating a target, no clear exclusion can be made here. The bullets items 2, 3 and 5 are classified as indifferent in relation to the reference bullets item 1.
8WUAUG	We did not find sufficient matching individual characteristics between the questioned and comparison bullets, while the non matching is clearly expressed so that it is possible to define their affiliation to another firearm.
8X2RTD	IT WAS NOT POSSIBLE to determine whether the bullets from item 2, item 3 and item 5, were discharged from the same firearm as the known test-fired bullets of Item 1. The bullet from item, 4 WAS NOT discharged from the same firearm as the known test-fired bullets of Item 1.
8XXAL2	Evidence items 2-5 have not been fired in the evidence firearm seized item 1 (CZ 75 P-07). Evidence items 2, 3, 5 were fired in the same unknown firearm. Evidence item 4 was fired in another unknown firearm. Police will be advised to be in the look out and bring in other two firearms for testing consistent with the bullets found at the scene.
97UJEC	Examined the three specimens marked #2, #3, and #5. They weigh 179.2, 180.2, and 179.9 grains and indicate six lands and six grooves with a right-hand twist. It is a 40-caliber class, discharged full metal jacketed bullets. Examined the specimen marked #4. It weighs 180 grains, respectively and indicate six lands and six grooves with a right-hand twist. It is a 40-caliber class, discharged full metal jacketed bullet. Examined the test standards marked T1, T2, and T3. They were 40 S&W caliber discharged full metal jacketed bullets. They were test fired from a 40 S&W caliber CZ 75 P-07 semiautomatic pistol. The discharged bullets marked #2, #3, and #5 were microscopically compared to each other and identified as having been discharged from the same firearm. The discharged bullets marked #2, #3, and #5 were microscopically compared to the test standards (T1, T2, & T3). The results of the microscopic

TABLE 2

WebCode	Conclusions
	comparison were inconclusive. The discharged bullets marked #2, #3, and #5 were microscopically compared to the discharged bullet marked #4 and they were eliminated as having been discharged from the same firearm. The discharged bullet marked #4 was microscopically compared to the test standards (T1, T2, & T3) and eliminated as having been discharged from the same firearm.
984DAC	The results of the analyst (1) fired bullets in item 2, (1) fired bullet in 3, (1) fired bullet in item 4 and (1) fired bullet in item 5 found that it has (2) groups of individual characteristics. Therefore i think it was fired from (2) guns.
98LHTA	By means of bullets and its derivatives examination, microscopic and microscopic comparison examinations it was determined that: 1. The bullets corresponding to item 1, marked E-1, E-2, E-3, are caliber .40/10mm, with striation to the right (R-6) and were fired by the same firearm (Identification). [Initials] November/15/2023 2. The bullets corresponding to items 2, 3 and 5, marked E-4, E-5 and E-7, are caliber .40/10mm, with striations to the right (R-6) and were fired by the same firearm (Identification). [Initials] November/15/2023 3. The bullet corresponding to item 4, marked E-6, is a .40/10mm caliber, with striation to the right (R-6) and was fired from a firearm. [Initials] November/15/2023
9EK6HP	1) 10/26/2023 (3), test fired bullets from CZ 75 P-07 40 S&W pistol. 2) 10/26/2023 (1), fired bullet. 3) 10/26/2023 (1), fired bullet. 4) 10/26/2023 (1), fired bullet. 5) 10/26/2023 (1), fired bullet. RESULTS: Items 2, 3, and 5 have physical and design characteristics consistent with being .40/10mm caliber and no list was established of firearms that could have possibly fired them. Items 1 (test fired bullets), 2, 3, and 5 were microscopically examined and compared. Agreement of class characteristics was observed. However, there is insufficient agreement or disagreement of individual characteristics to either identify or eliminate the bullets as having been fired from the same firearm. Item 4 has physical and design characteristics consistent with being .40/10mm caliber. Firearms that could have fired it include the following semiautomatic pistols: Glock, 10mm Auto and 40 S&W Bersa, 40 S&W Heckler & Koch, 40 S&W IMI, 40 S&W Kahr Arms, 40 S&W Vektor, 40 S&W NOTE: This list should not be considered all-inclusive of all makes and/or models of firearms that could have possibly fired the listed bullet. Items 1 (test fired bullets), 2, 3, 4, and 5 were microscopically examined. Based on observed disagreement of class characteristics, Item 4 was eliminated as having been fired in the same firearm(s) as Items 1 (test fired bullets), 2, 3, and 5.
9EPKVP	Items 2 - 5 were not fired in the same firearm as Item 1 (elimination). This is also the opinion of Firearms Examiner [NAME]. Items 2, 3, and 5 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner [NAME]. Item 4 was not fired in the same firearm as Items 2, 3, and 5 (elimination). This is also the opinion of Firearms Examiner [NAME]. Items 2 - 5 are consistent with the 40 caliber family, which includes 40 S&W and 10 mm Auto. Items 2, 3, and 5 could have been fired in a 40 S&W firearm produced or marketed by manufacturers listed in Appendix 01 or a 10mm Auto firearm produced or marketed by manufacturers listed in Appendix 02 [Appendix not provided]. Item 4 could have been fired in a 40 S&W firearm produced or marketed by manufacturers listed in Appendix 03 or a 10mm Auto firearm produced or marketed by manufacturers listed in Appendix 04 [Appendix not provided].
9GC4WM	Results: The reporting outcome of the microscopic examination and comparison of items 1 and 1,2,3,5 – Match / positive identification, The reporting outcome of the microscopic examination and comparison of items 1 and 4 Non match / negative identification, Conclusion: In my opinion items 2,3 and 5 were a microscopic match to the bullets from item 1. Therefore they were also fired from this pistol CZ 75 P-07 pistol. Item 4 did not match item

TABLE 2

WebCode	Conclusions
	1 and so was fired from a second different firearm. The Decision Rules (1-4) which include the hypothesis and opposing propositions as appropriate, are detailed below, the outcome is highlighted in bold : 1) Match / positive identification - A positive result or 'match' means comparison of toolmarks enables opinions of common origin to be made when the unique surface contours of two toolmarks are in "sufficient agreement"* items 1,2,3,5 2) Non match / negative identification - A negative result or 'non-match' means comparison of toolmarks does not enable opinions of common origin to be made when the unique surface contours of two toolmarks are compared. Item 4
9PM7HN	The hypothesis that bullet 4 is not fired from the recovered firearm (known - bullet 1) is very strongly supported. It is not possible to determine whether bullets 2, 3 and 5 were fired from the recovered firearm (known - bullet 1).
A6BZ6Y	Upon request, test fired bullets from Item 1 were microscopically examined and compared with recovered fired bullets, Item 2, 3 and 5. There is observed agreement of their discernible class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate Items 2, 3 or 5 as having been fired from the same firearm as the test fired bullets from Item 1. Upon request, test fired bullets from Item 1 were microscopically examined and compared with the recovered fired bullet, Item 4. Based on the observed disagreement of their class characteristics, Item 4 is eliminated as having been fired from the same firearm as the test fired bullets from Item 1.
A6FFHY	1. Exhibit 1 is three .40 bullets indicated to be test standards and Exhibits 2-5 are each one .40 bullet. a. Comparison revealed Exhibits 2, 3, and 5 were fired from the same firearm based on sufficient agreement of class and individual characteristics. b. Comparison revealed Exhibits 2, 3, and 5 could not be identified or eliminated as having been fired from the same firearm as Exhibit 1 based on insufficient agreement of individual characteristics. c. Comparison revealed Exhibit 4 was not fired in the same firearm as Exhibit 1 based on disagreement of class characteristics. d. Comparison revealed Exhibits 2, 3, and 5 were not fired in the same firearm as Exhibit 4 based on disagreement of class characteristics.
A6ZT9X	Items 1 through 5 (fired bullets) were microscopically examined and compared. Based upon an agreement of class characteristics and sufficient individual characteristics, Item 1 (fired bullets) were fired through the same firearm barrel. (Firearm 1) Based upon an agreement of class characteristics and sufficient individual characteristics, Items 2, 3, and 5 (fired bullets) were fired through the same firearm barrel. (Firearm 2) Based upon an agreement of class characteristics but sufficient disagreement of individual characteristics, Items 2, 3, and 5 (fired bullets) were not fired through the same firearm barrel as Item 1 (fired bullets). Based upon differences in class characteristics, Item 4 (fired bullet) was not fired through the same firearm barrel as Item 1 (fired bullets). Based upon differences in class characteristics, Item 4 (fired bullet) was not fired through the same firearm barrel as Items 2, 3, and 5 (fired bullets). (Firearm 3)
A83WUT	The firearm that fired CTS Item 1 bullets fired CTS Items 2, 3, and 5 bullets. CTS Item 4 bullet is consistent with bullets commonly found loaded in some 40 S&W and 10mm Auto caliber cartridges. This bullet was not fired by the same firearm that fired CTS Items 1, 2, 3, and 5 bullets. See the attachment for a list of possible firearm manufacturers/origins that may have fired this bullet. Note that this list may not be all inclusive.
ALY7GY	SUBMISSION 2, 3, and 5: The projectiles were identified to the same unsubmitted firearm. The projectiles were inconclusive to the submission 001 pistol due to a lack of corresponding individual characteristics.

TABLE 2

WebCode	Conclusions
AQFE6X	1. Examination of Exhibit 1 disclosed it to be three (3) fired .40 caliber full metal jacketed bullets. Exhibit 1 was test fired from the suspect's firearm and submitted to the laboratory for comparison purposes. Due to an insufficient agreement of individual characteristics, one (1) of the test fired bullets within Exhibit 1 was deemed unsuitable for comparison. The two (2) remaining bullets of Exhibit 1 were utilized in the microscopic comparisons discussed below. 2. Examination of Exhibits 2 through 5 disclosed them to be four (4) fired .40 caliber full metal copper jacketed bullets. Each fired bullet displays rifling of a right hand twist of six (6) land and groove impressions. Due to a difference in class characteristics (polygonal rifling), Exhibit 4 was eliminaed s having been fired from the same firearms as Exhibits 1, 2, 3, and 5. 3. Exhibits 1, 2, 3, and 5 were microscopically compared to one another. As a result the following was concluded: 3a. Due to a sufficient agreement of individual characteristics, Exhibits 2, 3, and 5 were identified as having been fired from the same firearm. 3b. Due to an insufficient agreement or disagreement of individual characteristics, it could not be concluded that Exhibit 1 had been fired from the same firearm as Exhibits 2, 3, and 5.
ARQDY8	Items #2, #3 and #5 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 from the same firearm. Items #2, #3 and #5 were microscopically examined and compared to 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 the items as having been from the same firearm. Item #4 was microscopically examined and compared to Items #1, #2, #3 and #5. Based on the observed disagreement of class characteristics, Item #4 is eliminated as having been fired from the same firearm as Items #1, #2, #3 and #5.
ATK46L	Based on the agreement of discernible class characteristics and sufficient matching individual detail, fired bullet items 2, 3, and 5 were identified as having been fired from the same firearm. Based on the significant disagreement of individual characteristics, bullet items 2, 3, and 5 were eliminated as having been fired from the same firearm as fired bullet items 1(A-C). Based on the significant disagreement of class characteristics, bullet item 4 was eliminated as having been fired from the same firearm as fired bullets items 1(A-C).
B3LV7Z	None of the questioned recovered bullets from Item 2 to 5 were discharged from the same firearm as the known test-fired bullets (Item 1) However we can see that the bullets from Item 2, Item 3 and Item 5 bears similar characteristics. They were were discharged from the same firearm. On the other hand, the bullet from Item 4 was discharged from a third firearm.
B4DW8G	An examination had been conducted with the comparison microscope. Item 2 and Item 3 had the same individual characteristics with Item 1. Item 4 and Item 5 are different from Item 1. Therefore, we had a conclusion that the Item 2 and Item 3 was fired from the suspect's firearm. Item 4 and Item 5 were not fired from suspect's firearm.
B8WWDP	Items 1-5 were examined and analyzed using microscopy. The Item 2, 3, and 5 caliber 40/10mm class bullets were each fired from a firearm having a barrel rifled with six (6) lands and grooves inclined to the right. The Item 2, 3, and 5 bullets exhibit the same general rifling class characteristics as the Item 1 bullets; however, the result of the microscopic comparison was inconclusive due to the lack of sufficient suitable corresponding microscopic markings. It was not possible to identify or eliminate the Item 2, 3, and 5 bullets as having been fired from the same firearm as the Item 1 bullets. The Item 2 and 5 bullets were identified as having been fired from the same firearm based on corresponding class and individual characteristics. The Item 3 bullet exhibits the same general rifling class characteristics as Items 2 and 5; however,

TABLE 2

WebCode	Conclusions
	the result of the microscopic comparison was inconclusive due to the lack of sufficient suitable corresponding microscopic markings. It was not possible to identify or eliminate the Item 3 bullet as having been fired from the same firearm as Items 2 and 5. The Item 4 caliber 40/10mm class bullet was fired from a firearm having a barrel rifled with six (6) polygonal lands and grooves inclined to the right. Due to the lack of microscopic markings for comparison, the Item 4 bullet is not suitable for identification with any firearm. Item 4 was eliminated as having been fired in the same firearm as Items 1, 2, 3, and 5 due to differences in class characteristics. Firearms that produce general rifling class characteristics like those present on Item 4 include firearms with the brand names listed below. -Glock, caliber 10mm Auto and 40 S&W pistols -Heckler & Koch, caliber 40 S&W pistols This list is not all-encompassing; it is possible another brand of firearm produced these class characteristics and is not listed due to the content of the databases searched.
BA3LDD	"The bullet in item 4 was not fired from the firearm used to test-fire the bullets in item 1. A: The bullets in 2, 3 and 5 were fired from the same gun as the bullets in 1; B: The bullets in 2, 3 and 5 were fired from another gun (not as item 1). The findings provide support for the proposition that the bullets in 2, 3 and 5 were fired from another gun rather than the same gun as the bullets in 1." Regarding the bullets in items 1, 2, 3 and 5, our normal approach would be to give a level of support for one proposition rather than its alternative (ie fired in same firearm or different firearms). However, experience of proficiency tests shows we are much more likely to find that two guns of the same calibre and rifling form are used, possibly sharing sub-class similarities, than we would expect in our normal casework under the 'scenario' provided. This means that our normal casework approach to reporting conclusions would not be appropriate for this exercise. Our casework also includes shots fired in incidents by police or military, where more than one gun of a particular type is deployed and the question is which gun fired a particular bullet. Such incidents appear to more closely reflect the nature of proficiency tests where two or more guns of the same type are often involved. Under this police/military casework scenario, we would normally consider two competing propositions, and state that the findings provide a level of support for one rather than the other. This is based on our findings that some firing mark detail correspondence has been found between 2, 3, and 5, which we have not observed within the test-fires for 1. We would normally assign a level for this support, using a standard verbal scale, but this is not appropriate here given that it partly depends on the particular scenario.
BA7VLC	"Police recovered four bullets from the crime scene and confiscated a CZ 75 P-07 firearm in the possession of a suspect who was arrested earlier that day. Three rounds of 180-grain FMJ-FP PMC .40 S&W ammunition (consistent with bullets found at the scene) were tested with the suspect's firearm and the bullets were collected. Investigators ask that you compare the bullets recovered from the scene to test bullets fired from the suspect's firearm and report your findings." The microscopic comparison procedure was carried out between the samples collected at the scene (items two, three, four and five), finding two different groups, formed as follows: GROUP NUMBER ONE: Made up of items two, three and five, finding microscopic characteristics of identity common to each other, in their grooves and solids, that is, these projectiles were fired by the same firearm. GROUP NUMBER TWO: Made up of item four, which presents different class and microscopic characteristics than those of group number one. Subsequently, a microscopic comparison was carried out between the samples obtained from the pistol-type firearm, brand CZ, model 75 P-07, caliber .40 S&W, seized from the suspect, which has different microscopic characteristics than those of groups number one and two, that is, the weapon seized from the suspect did not fire any of the projectiles found at the scene.

TABLE 2

WebCode	Conclusions
BBFWQJ	The Items 2, 3, and 5 fired bullets were determined to be .40/10mm caliber class bullets which have been fired through firearms having a rifling system of six (6) lands and grooves with a right twist. Items 2 and 3 could neither be identified nor eliminated as having been fired from the Item 1 firearm due to insufficient agreement or disagreement of individual characteristics; however, similar class characteristics were noted. The lists of firearms with a similar rifling pattern that could have fired Items 2 and 3 or Item 5 were too inclusive to be of any investigative value; however, a complete list of the search results will be maintained in the case file. Item 5 could neither be identified nor eliminated as having been fired from the Item 1 firearm due to insufficient disagreement of individual characteristics; however similar class characteristics were noted. Item 5 could neither be identified nor eliminated as having been fired from the same unknown firearms as Items 2 and 3 due to insufficient agreement of individual characteristics; however, similar class characteristics were noted. The Item 4 fired bullet was determined to be a 0.40/10mm caliber class bullet which has been fired through a firearm having a polygonal rifling system of six (6) lands and grooves with a right twist. Firearms with a similar rifling system include but are not limited to the following: Glock 10mm Auto caliber semiautomatic pistols; Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor .40 S&W caliber semiautomatic pistols. This list is not all-inclusive and should be be used to eliminate any suspect firearm of similar caliber and class characteristics. Item 4 was eliminated as having been fired from the Item 1 firearm and the same unknown firearms as Items 2, 3, and 5 due to disagreement of discernible class characteristics.
BCTNJ2	On October 23, 2023, [Name] of the [Laboratory] Quality Assurance Section delivered the following to this section for examination: 1-1: Three (3) metal jacketed lead spent projectiles (A,B,C) test fired from CZ 75 P-07 pistol. 1-2: One (1) metal jacketed lead spent projectile. 1-3: One (1) metal jacketed lead spent projectile. 1-4: One (1) metal jacketed lead spent projectile. 1-5: One (1) metal jacketed lead spent projectile. Compared Items: 1-1: A,B,C to Items 1-2, 1-3, 1-4, and 1-5. After physical and microscopic examination of the submitted evidence, it is my opinion that; A) The metal jacketed lead spent projectiles mentioned above in Items 1-2, 1-3, and 1-5 were fired from the same unknown weapon/barrel capable of firing .40 caliber ammunition and possessing a general rifling characteristic of six (6) lands and grooves with a right twist with cut rifling. However, due to a disagreement of individual microscopic markings when compared to Items 1-1 A,B,C, Items 1-2, 1-3, and 1-5, were not fired from the CZ 75 P-07 pistol. “IDENTIFICATION and EXCLUSION” B) The metal jacketed lead spent projectile mentioned above in Item 1-4 was fired from an unknown weapon/barrel capable of firing .40 caliber ammunition and possessing a general rifling characteristic of six (6) lands and grooves with a right twist with polygonal rifling. Due to a disagreement of class characteristics (polygonal vs. cut rifling), Item 1-4 was not fired by CZ 75 P-07 pistol, nor the unknown weapon that fired Items 1-2, 1-3, and 1-5. “EXCLUSION”
BDN97Z	The examination of recovered bullets under a comparison microscope, allows us to conclude that the questioned bullets of the item 2,3 and 5 were fired from a second firearm, and the item 4 from a third one.
BEWJ34	Items #2, #3, and #5 were microscopically examined and compared to Item #1 (agency test fires - bullets). 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(s). Item #4 was microscopically examined and compared to Item #1 (agency test fires - bullets). Based on the observed disagreement of class characteristics, Item #4 is eliminated as having been fired from the same firearm as Item #1 (agency test fires - bullets). Items #2, #3 and #5 were microscopically examined and compared. There is observed agreement of their class characteristics. However,

TABLE 2

WebCode	Conclusions
	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(s). Item #4 was microscopically examined and compared to Items #2, #3, and #5. Based on the observed disagreement of class characteristics, Item #4 is eliminated as having been fired from the same firearm(s) as Items #2, #3, and #5.
BGGEHG	The bullets in items 2, 3 and 5 were fired by the CZ 75 P-07 firearm, that is, there is identity.
BHH7XC	AFTER EXAMINING THE EXHIBITS UNDER THE MICROSCOPE WE FOUND THAT ITEM 2(QUESTIONED) IS A MATCH WITH ITEM 1(CONTROL), WHILE ITEM 3, 4, 5(QUESTIONED) DIDN'T MATCHED UNDER THE MICROSCOPE
BK7L6Y	AL REALIZAR EL ESTUDIO MICRO COMPARATIVO ENTRE LAS BALAS "TESTIGO" OBTENIDAS MEDIANTE DISPAROS DE PRUEBA DEL ARMA DE FUEGO CORTA , TIPO PISTOLA, DE LA MARCA CZ, MODELO 75P07, CALIBRE POR DESIGNACION .40 S&W CON LAS BALAS "PROBLEMA" IDENTIFICADAS COMO "ITEM 2", "ITEM 3", "ITEM 4" E "ITEM 5", SE DETERMINA QUE NO FUERON DISPARADAS POR LA MISMA ARMA DE FUEGO. [Translation not provided at time of publication.]
BKLV4R	Items 2, 3, 4 and 5 were not fired in the same firearm as the item 1 test fires. Items 2, 3 and 5 were fired in a second firearm. Items 2, 3 and 5 are consistent with bullets from ammunition designated 40 S&W. A list of makes of firearms that may have fired these items includes, but is not limited to: Beretta, Ceska Zbrojovka, FN/Browning, Heckler & Koch, Heritage, Republic Arms, Sigarms, Smith & Wesson, Springfield Inc, Steyr, Taurus, TNW Incorporated. Item 4 was fired in a third firearm. Item 4 is consistent with a bullet from ammunition designated 40 S&W or 10mm Auto. A list of makes of firearms that may have fired this item includes, but is not limited to: Glock, Heckler & Koch, IMI, Kahr Arms, Vektor and Bersa.
BKPEB3	Exhibits 2, 3 and 5 (spent projectiles) were identified as having been fired in the same .40 caliber firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis. Exhibits 2, 3, and 5 were not fired in the same firearm that fired exhibit 1 (spent projectiles from suspect's firearm) based on differences in individual characteristics. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis. Exhibit 4 (spent projectile) was not fired in the same firearm as exhibits 1, 2, 3, or 5 based on differences in class characteristics. Suspect weapons include .40 S&W Glock pistols; however, any suspect weapon should be submitted to the laboratory for examination.
BM7U9A	1) There are two guns in this case. 2) Item 2,3 and 5 are fired using the same gun. 3) While item 4 uses another weapon. 4) Item 1 has three bullets that are shot tested and they match items 2,3 and 5. 5) Item 1 from the suspect's firearm.
BM9F6P	The fired bullets labeled as items 1,2,3 and 5 have 6 - Right conventional rifling characteristics. The fired bullet labeled as item 4 has 6 - Right polygonal rifling. The above evidence was microscopically examined and intercompared. In my opinion, none of the submitted questioned bullets are identified as being fired from the suspects firearm. However, items 2,3, and 5 are identified a being fired from the same .40 caliber pistol based on the agreement seen in the land and groove engraved areas on the bullets. Item 4 had polygonal rifling and is eliminated as being fired from the suspect's firearm and the same firearm that fired items 2,3, and 5.
BWH8AD	[No Conclusions Reported.]

TABLE 2

WebCode	Conclusions
BYPDXZ	Laboratory Items #001.B, 001.C, and 001.E (items 2, 3, & 5), three fired FMJ bullets are identified as being fired by the same firearm. Laboratory Items #001.B, 001.C, and 001.E (items 2, 3, & 5), three fired FMJ bullets are inconclusive as being fired by the same firearm as Laboratory Item #001.A (item 1) three test fired bullets from the suspect's firearm. An inconclusive finding resulted from agreement of all discernible class characteristics, without agreement or disagreement of individual characteristics due to absence, insufficiency, or lack of reproducibility. Laboratory Item #001.D (item 4) fired FMJ bullet is eliminated as being fired by the same firearm as Laboratory Item #001.A (item 1) three test fired bullets from the suspect's firearm. Laboratory Item #001.D (item 4) fired FMJ bullet is eliminated as being fired by the same firearm as Laboratory Items #001.B, 001.C, and 001.E (items 2, 3, & 5), three fired FMJ bullets.
BZWNJH	Having carried out the comparative study of the three test bullets fired by the suspect's weapon, with the bullets recovered by the police at the crime scene, it is concluded that the bullets corresponding to item 2, item 3, and item 5, have been shot with the same firearm as the suspect.
BZXEXD	Item #2 and #3 were microscopically identified as having been fired from the same unknown firearm. There were inconclusive results when comparing Item #1, Item #2 group, and Item #5 against each other due to insufficient corresponding microscopic markings to permit an identification or an elimination. Item #4 was eliminated from having been fired from the same firearm as Item #1, Item #2 group, and Item #5, due to different rifling type (polygonal vs conventional).
CD2XAC	Items 2, 3, and 5 (3 total) share discernible class characteristics, but could be neither identified nor eliminated as having been fired from the item 1 firearm due to a lack of sufficient agreement or disagreement of individual characteristics and are therefore inconclusive. Item 4 was eliminated as having been fired from the item 1 firearm based upon differences in class characteristics. (conventional rifling vs. polygonal rifling)
CF48UE	1) Items 1, 2, 3, 4, 5: A microscopic comparison was conducted between Item 1 and Item 2,3,4 and 5. The examinations determined that Item 1 and Item 2,3,5 were fired from the same firearm due to a sufficient agreement between striations. 2) The examinations determined that Item 4 was fired from the difference firearm due to a sufficient agreement between striations.
CJAGAQ	After microscopic comparison, I identified three fired bullets (Items 2, 3, and 5) as having been fired from the suspect's CZ 75 P-07 firearm, based on sufficient agreement of individual characteristics in the land impressions. Item 4, a fired bullet, was eliminated as having been fired in the suspect's CZ 75 P-07 firearm, due to a difference in class characteristics.
CLUH6D	The comparative study was carried out in the comparison macroscope between the incriminating bullets recovered at the scene of the crime, marked as item 2, item 3 and item 5, and it was determined that they are identity, that is to say that they were fired from the same firearm. Subsequently, a comparative study was carried out in the comparison macroscope, between the bullets taken as a test fire of the firearm, pistol type CZ, model P-07, caliber .40 S&W and the incriminated bullets recovered at the scene of the crime, marked as items 2, 3 and 5, it was determined that they were identity, that is to say that they were fired by the same firearm mentioned above. The incriminating bullet marked as Item 4 was fired by a different firearm than those in Item 1.
CMTFML	The questioned items and necessary firearm test fires were microscopically analyzed and the results of the comparison and evaluations are as follows: The bullet evidence Q1 (Item 2), Q2

TABLE 2

WebCode	Conclusions
	(Item 3) and Q4 (Item 5) were identified as having been fired with the same unknown firearm. A conclusion of Identification (fired) is based on an analyst's determination that all discernible class and individual characteristics agree such that the extent of agreement exceeds that which has been demonstrated by toolmarks known to have been made by different tools (Known Non Matches) and is consistent with the agreement demonstrated by toolmarks known to have been made by the same tool (Known Matches). The bullet evidence Q3 (Item 4) was excluded as having been fired with K1 (Item 1) based on disagreement of rifling type. The bullet evidence Q3 (Item 4) was excluded as having been fired with the same firearm as bullet evidence Q1 (Item 2), Q2 (Item 3) and Q4 (Item 5) based on disagreement of rifling type. A conclusion of exclusion is based on an analyst's determination that the observed characteristics of the items in question were marked by different tools. It was not possible to identify or exclude the bullet evidence Q1 (Item 2), Q2 (Item 3) and Q4 (Item 5) as having been fired with K1 (Item 1) based on insufficient disagreement. A conclusion of inconclusive is based on an analyst's determination that there is agreement of all discernible class characteristics, but, due to an absence, insufficient agreement and/or disagreement, or lack of reproducibility of individual characteristics, no other conclusion can be reached.
DEAR44	The test fired bullets marked #1 were examined and microscopically compared to the bullets marked #2, #3 and #5. The results of the comparisons were inconclusive. The test fired bullets marked #1 and the bullets marked #2, #3, and #5 were examined and microscopically compared to the bullet marked #4. The bullets were eliminated as having been discharged in the same unknown pistol as the bullet marked #4.
DF4HAH	Items 2 through 5 and test fired bullets, Items 001 a through c, are inconclusive. This means Items 2 through 5 could not be identified or eliminated as having been fired from the same firearm or from the submitted firearm.
DGEAGD	Results of Examinations: Items 1 through 5 are .40 caliber bullets. The Item 2, 3, and 5 bullets were identified as having been fired from the barrel of the same firearm. A pattern examination of the Item 2, Item 3, and Item 5 bullets and Item 1 bullet was inconclusive due to insufficient quality and/or quantity of corresponding individual characteristics. Due to a difference in class characteristics (polygonal rifling vs. conventional) the Item 4 bullet was excluded as having been fired from the barrel of the same firearm as the Item 1, Item 2, Item 3, and Item 5 bullets.
DGVGNF	The Item 2, 3 and 5 bullets are identified as having been fired in the same firearm. They are inconclusive as having been fired in the same firearm as the Item 1 bullets based on agreement of class characteristics and a lack of agreement/disagreement of individual characteristics. The Item 4 bullet is eliminated from having been fired in the same firearm as the Item 1 bullets and eliminated from having been fired in the same firearm as the Item 2, 3 and 5 bullets.
DN3X83	Item 001-04 was not fired in the CZ brand, model 75 P-07 pistol. Items 001-02, 001-03, and 001-05 could not be identified or eliminated as having been fired in the CZ brand, model 75 P-07 pistol.
DW822E	Items 2, 3 and 5 were all fired from the same firearm but are inconclusive with Item 1. Item 4 was not fired from Item 1 or the firearm that Items 2, 3 and 5 were fired from.
DWAR3V	The firearm that fired the three bullets in Item 1 was eliminated as having fired Items 2, 3, 4, and 5. Items 2, 3, and 5 were identified as having been fired from a second firearm. Items 4 was fired from a third firearm. A list of firearms having the characteristics of Items 2, 3, and 5 and a list of firearms having the characteristics of Item 4 will be sent electronically to the submitting agency. It should be noted that these lists do not necessarily contain all firearms having the observed characteristics.

TABLE 2

WebCode	Conclusions
DZPABY	The Item 4 bullet was not fired by the same firearm(s) as the Item 1, 2, 3, or 5 bullets. There is agreement of all discernible class characteristics and possible individual characteristics between the Item 2 and 5 bullets. However, the potential for subclass carryover could not be eliminated. Therefore, the Item 2 and 5 bullets were either fired by the same firearm, or by a different firearm manufactured with the same tool in the same approximate state of wear. There is agreement of all discernible class characteristics between the Item 3 bullet and the Item 2 and 5 bullets; however, the comparison of microscopic characteristics was inconclusive. Therefore, the Item 3 bullet could not be identified or eliminated as having been fired by the same firearm(s) as the Item 2 and 5 bullets. There is agreement of all discernible class characteristics between the Item 2, 3, and 5 bullets and the Item 1 bullets; however, the comparison of microscopic characteristics was inconclusive. Therefore, the Item 2, 3, and 5 bullets could not be identified or eliminated as having been fired by the same firearm as the Item 1 bullets.
E2JHWN	Items – Description/Visual Examination: Item 1: Three (3) fired 40 caliber full metal jacket bullets with six (6) lands and grooves right- hand twist rifling impression, reportedly recovered from a CZ 74 P-07. Item 2, 3, & 5: Three (3) fired 40 caliber full metal jacket bullets with six (6) lands and grooves right-hand twist rifling impressions. Item 4: One (1) fired 40 caliber full metal jacket bullet with six (6) lands and grooves right-hand twist polygonal rifling impression. Microscopic Comparison: Conclusions: Identification: Based upon the reproducibility of class characteristics and microscopic individual characteristics, the following identifications were made: Lab Item #: Evidence: Type: Conclusion: 2, 3, & 5 (3) fired projectiles Fired thru the same firearm barrel. Elimination: Based upon the difference in class characteristics, the following eliminations were made: Lab Item #: Evidence: Type: Conclusion: 4 (1) fired projectile. Not fired thru the barrel of Item 1 and not fired thru the same firearm barrel as Items 2, 3, & 5 Based upon the difference in individual characteristics, the following eliminations were made: Lab Item #: Evidence: Type: Conclusion: 2, 3, & 5 (3) fired projectiles Not fired thru the barrel of Item 1. [Participant submitted data in a format that could not be reproduced in this report].
E3C933	A) The bullet marked E-1 to E-3 (Item 1), corresponding to piece 1, are .40/10mm caliber with rifling to the right (R-6) and were fired by the same firearm (Identification). [Initials] November 09, 2023 B) The bullet marked E-4 to E-6 (Item 2, Item 3 and Item 5), corresponding to piece 1, are .40/10mm caliber with rifling to the right (R-6) and were fired by the same firearm (Identification). [Initials] November 09, 2023 C) The bullet marked E-7 (Item 4), corresponding to piece 1, is .40/10mm caliber with rifling to the right (R-6) and was fired from a firearm. [Initials] November 09, 2023
EAP9D7	2.1. The results of the analysis of (1) fired bullet in item 2, (1) fired bullet in item 3, (1) fired bullet in item 4 and (1) fired bullet in item 5 found that it has (2) groups of individual characteristics. Therefore I think it was fired from (2) guns
EEUJ2U	Bullet Analysis: Methodology: Physical (Visual Examination). Electronic Balance/Digital Caliper/Digital Micrometer. Microscopy (Comparison Microscope). Items 1t1, 1t2, 1t3, 2, 3, 4, and 5 are 40 caliber class bullet based upon the diameter. Items 1t1, 1t2, and 1t3, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 5, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Comparisons between Items 1t1, 1t2, and 1t3, the bullets, to Items 2, 3, and 5, the bullets, were inconclusive due to insufficient individual microscopic characteristics. Item 4, the bullet, was not fired through the barrel of the same firearm as Items 2, 3, and 5 based upon different class characteristics. Item 4, the bullet, was not fired through the barrel of the

TABLE 2

WebCode	Conclusions
	same firearm as Items 1t1, 1t2, and 1t3 based upon different class characteristics. Opinion/Interpretation: Items 1t1, 1t2, 1t3, 2, 3, 4, and 5 is consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style.
EJ2A4Z	I microscopically compared the submitted bullets (Items 001-01A through 001-01C), reportedly test-fired from the suspect's firearm, a CZ 75 P-07 semiautomatic pistol. The overall quantity and quality of reproducible individual characteristics was extremely poor. Therefore, I concluded the firearm does not appear to be capable of consistently reproducing individual characteristics sufficient for identification. I microscopically compared one of the submitted test-fired bullets (Item 001-1A) to the four submitted fired bullets (Items 001-02 through 001-05), reportedly recovered from the scene. With respect to Items 001-02, 001-03, and 001-05, I observed agreement of all discernable class characteristics without significant agreement or disagreement of individual characteristics due to an insufficient quantity and quality of reproducible individual characteristics exhibited on the submitted items. Therefore, my results are inconclusive. With respect to Item 001-04, I observed significant disagreement of discernable class rifling characteristics and concluded Item 001-04 was not fired from the same firearm that was used to produce the submitted test-fired bullets, Items 001-01A through 001-01C.
EJGH8A	The Item 2,3 bullets were fired in the same firearm as known bullets (Item1).
ETMJ6E	Comparative examination of Item 1 (test-fired 40 caliber bullets) against Items 2, 3 & 5 (40 caliber bullets) reveal disagreement of individual features. This means that Item 1 did not fire Items 2, 3 or 5. Comparative examination of Item 1 (test-fired 40 caliber bullets) against Item 4 (40 caliber bullet) reveal different class characteristics. This means that Item 1 did not fire Item 4. Comparative examination of Items 2, 3 & 5 show the presence of corresponding features. This means that Items 2, 3 & 5 are consistent with having been fired in the same firearm. * *Source identification is reached when the discernible class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source.
EVA2MZ	Item 1 - "Three known test-fired bullets discharged from the suspect's firearm" (1). Item 2 - One (1) fired bullet consistent with .40 S&W/10mm Auto caliber (2). Item 3 - One (1) fired bullet consistent with .40 S&W/10mm Auto caliber (3). Item 4 - One (1) fired bullet consistent with .40 S&W/10mm Auto caliber (4). Item 5 - One (1) fired bullet consistent with .40 S&W/10mm Auto caliber (5). Examinations Performed: Items 2-5 were examined, microscopically inter-compared, and compared to Item 1 known bullets. Results: Item 4 exhibits patterns and markings that are inconsistent with Items 2, 3, and 5 and inconsistent with Item 1 known bullets. Items 2, 3, and 5 exhibit patterns and markings that are consistent with each other. Items 2, 3, and 5 exhibit patterns and markings that are inconclusive: neither consistent nor inconsistent with Item 1 known bullets. Conclusions: As a result of microscopic comparison, it was concluded that Item 4 is eliminated as having been fired in the same firearm(s) as Items 2, 3, 5, and Item 1 known bullets due to significant disagreement of class characteristics. As a result of microscopic comparison, it was concluded that Items 2, 3, and 5 are identified as having been fired in the same firearm. As a result of microscopic comparison, it was concluded that Items 2, 3, and 5 are inconclusive as having been fired in the same firearm that fired Item 1 known bullets due to insufficient agreement or disagreement of individual characteristics and damage. Firearms that produce similar rifling characteristics as those exhibited on Items 2, 3, and 5 include, but are not limited to .40 S&W caliber firearms manufactured by: Beretta, Ceska Zbrojovka, SIG Arms, Smith & Wesson, Steyr, and Taurus. Firearms that produce similar rifling characteristics as those exhibited on Item 4 include, but are not limited to .40 S&W

TABLE 2

WebCode	Conclusions
	caliber firearms manufactured by: Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor; and 10mm Auto caliber firearms manufactured by: Glock.
EWNQNR	Item 4 and item 1, 2, 3 and 5: The class characteristics in item 4 differ from those in item 1. Due to this difference this item cannot have been fired by the same firearm as the test fired bullets item 1. The class characteristics in item 4 also differ from those in items 2, 3 and 5. Due to this difference item 4 cannot have been fired by the same firearm as items 2, 3 and 5. Item 1 and Items 2, 3 and 5: The class characteristics in the items 2, 3 and 5 are (more or less) similar to those in item 1. Because of these similarities an additional examination has been done. Using the Bayesian approach in casework we view our findings under two hypotheses. In this test we used the following two hypotheses: - H1: The questioned bullets is fired by the submitted firearm. - H2: The questioned bullet is fired by 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) The findings are slightly more probable when H2 is true than when H1 is true. Items 2, 3 and 5: Similarities have been observed between the marks in items 2, 3 and 5. This observation lead to an additional examination between the marks. The findings of this examination were viewed under the following two hypotheses: - H1: The questioned items are fired by one firearm - H2: The questioned items are fired by two or three firearms of the same caliber and with the same class characteristics. The findings are slightly more probable when H1 is true than when H2 is true.
EYVNH9	It was not possible to determinate if the questioned bullets (items 2, 3, and 5) were fired by the suspect´s firearm (item 1), or if they were fired by another weapon with similar class marks. The questioned recovered bullet (Items 4) was not discharged from the same firearm as the known test-fired bullets (Item 1)
EZ9F94	A. The bullets described in the items 2, 3, 4, and 5 are .40/10mm, with six (6) lands and grooves, right twist (R-6); it was not fired by the firearm used to fire the bullets described in the item 1. [Initials] December/15/2023 B. The bullets described in the items 2, 3 and 5, were fired by same firearm (identification). [Initials] December/15/2023 C. The bullet described in the item 4 was fired by a firearm. [Initials] December/15/2023
F8HBH4	The fired jacketed bullets in items 001-02, 001-03, 001-04, and 001-05 were microscopically compared to test fired bullets in item 001-01 (recovered from a CZ 75 P-07) with the following results: Item 001-04 was eliminated as having been fired through the same barrel as the item 001-01 test fired bullets. Items 001-02, 001-03, and 001-05 were inconclusive as to having been fired through the same barrel as the item 001-01 test fired bullets without agreement or disagreement of individual characteristics due to a lack of reproducibility.
FA9CL7	Submission F2 consists of item 1, three bullets test fired from a pistol recovered from the suspect, and items 2 through 5, four bullets recovered from the crime scene. The items were each identified as expended nominal 40 caliber (10 millimeter) bullets with six-right rifling impressions. Items 1, 2, 3, and 5 were each marked with conventional rifling impressions. Item 4 was marked with polygonal rifling impressions. Comparison of the item 1 test-fired bullets to the items 2, 3, and 5 bullets was inconclusive. While the firearm-related class characteristics were the same, disagreement of individualizing characteristics were observed. The disagreement of individualizing characteristics was not sufficient to allow elimination. The items 2, 3, and 5 bullets are unlikely to have been fired from the firearm used to generate the item 1 bullets. Based on correspondence of firearm-related class characteristics and significant

TABLE 2

WebCode	Conclusions
	correspondence of individualizing characteristics, I identified the item 2 and item 3 bullets to a common source. The common source is most likely a single firearm but may be the same tooling used to manufacture a limited number of firearms. Comparison of the item 3 (and item 2 by proxy) and item 5 bullets was inconclusive. While the firearm-related class characteristics were the same, the limited correspondence of individualizing detail between the bullets was not sufficient for identification. Based on differences in firearm-related class characteristics, the item 4 bullet could not have been fired from the firearms used to generate the items 1, 2, 3, and 5 bullets.
FGRJEW	Items 001-AB, 001-AC, and 001-AE were identified as having been fired from the same firearm based on sufficient agreement of the class and individual characteristics. Items 001-AB, 001-AC, and 001-AE were neither identified nor eliminated as having been fired from the same firearm that fired the test fired bullets from item 001-AA based on agreement of the class characteristics but insufficient agreement or disagreement of the individual characteristics. All related comparisons were inconclusive. Item 001-AD was eliminated as having been fired from the same firearm that fired items 001-AB, 001-AC, and 001-AE based on significant disagreement of the class characteristics. Item 001-AD was eliminated as having been fired from the same firearm that fired the test fired bullets from item 001-AA based on significant disagreement of the class characteristics.
FMY2MX	Items #2,3 & 5 were microscopically compared to firearm, Item#1 with inconclusive results. A microscopic comparison was performed; however, there is insufficient detail of the class and /or individual characteristics for an identification or an elimination finding. Item#4 was eliminated as having been fired from the same firearm due to differences in class characteristics.
FP6KRK	The Item 1, 2, 3, 4, and 5 bullets were microscopically examined. The Item 2, 3, and 5 caliber 40 class bullets were identified as having been fired from the same firearm based on corresponding class and individual characteristics. The Item 2, 3, and 5 bullets were eliminated as having been fired from the firearm represented by the Item 1 bullets due to differences in individual characteristics. The Item 4 caliber 40 class bullet was found to exhibit markings that may be suitable for identification with the firearm from which it was fired. The Item 4 bullet was eliminated as having been fired from the firearm represented by the Item 1 bullets and from the same firearm as the Item 2, 3, and 5 bullets due to differences in class characteristics.
FQERQ8	Instrument Quantity: The test-fired bullets (Item 1) were examined and intercompared. The unknown bullets (Items 2 through 5), were examined and microscopically compared to the test-fired bullets. Items 2, 3, and 5 were compared to the test-fired bullets. The class characteristics were similar, but based on the disagreement of individual characteristics in the land and groove impressions, Items 2, 3, and 5 were not fired from the same firearm as the test-fired bullets. Item 4 was compared to the test-fired bullets. Based on the disagreement of class characteristics in the rifling of the land and groove impressions, Item 4 was not fired from the same firearm as the test-fired bullets. Items 2, 3, and 5 were intercompared. The class characteristics were similar; based on the agreement of individual characteristics in the land impressions, Items 2, 3, and 5 were fired from the same unknown firearm.
FR38XU	Microscopic examination and comparison reveal that the bullets, Items 2, 3 and 5, were not fired from the same firearm as the bullets, Item 1, based on a disagreement of individual characteristics. Microscopic examination and comparison reveal that the bullet, Item 4, was not fired from the same firearm as the bullets, Item 1, based on a disagreement of class characteristics.

TABLE 2

WebCode	Conclusions
FT6TWV	As a result of physical and microscopic examination of the submitted evidence (Items 2, 3, 4 &5) and test fires (Item 1), it is my opinion that: A) Item 4 was fired from an unknown weapon, capable of firing .40 caliber class ammunition which possesses polygonal rifling and has 6 lands and grooves with a right twist. Item 4 WAS NOT FIRED from the same weapon(s) which produced Item 1 (test fires), nor Items 2, 3 & 5 (unknown). B) Items 2, 3 & 5 WERE ALL FIRED from the same unknown weapon, capable of firing .40 caliber class ammunition which possesses a cut rifling system with 6 lands and grooves with a right twist. C) Items 2, 3 & 5 were not fired from the same weapon which produced Item 1 (suspect weapon/ test fires).
FXWZE4	1. The bullet projectiles marked E-1 to E-3, corresponding to item 1, are .40/10mm caliber with striations to the right (R-6) and were fired by the same firearm (Identification). [Initials] 21/nov/2023 2. The bullet projectiles marked E-4, E-5 and E-7, corresponding to item 1, are .40/10mm with striations to the right (R-6) and were fired by the same firearm (Identification). [Initials] 21/nov/2023 3. The bullet projectile marked E-6 (Item 4) corresponding to piece 1, did not undergo a microscopic comparison due to the disagreement of class characteristics. [Initials] 21/nov/2023
FY9QQT	Bullet Analysis: Methodology: Physical (Visual Examination). Electronic Balance/Caliper/Digital Micrometer. Microscopy (Comparison Microscope). Items 2, 3, 4, and 5 are 40 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 2, 3, and 5 are consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style. This bullet exhibits characteristics found in (but not limited to) the following firearms: caliber .40 S&W- Beretta, Ceska Zbrojovka, Czechoslovakia, Sigarms, Smith & Wesson, and Taurus. Opinion/Interpretation: Item 4 is consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style. This bullet exhibits characteristics found in (but not limited to) the following firearms: caliber .40 S&W- Bersa, Glock, Heckler & Koch, IMI, Kahr Arms; caliber 10mm Auto- Glock. Items 2, 3, and 5, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 5, the bullets, were not fired through the barrel of the same firearm as Item, 4, the bullet, based upon different class characteristics. Comparisons between Items 2, 3, and 5, the bullets, and bullets test fired through the barrel of Item 1, the CZ pistol, were inconclusive due to insufficient corresponding individual microscopic characteristics. Item 4, the bullet, was not fired in Item 1, the CZ pistol, based upon different class characteristics.
FZ2PGC	Based on microscopic comparisons, in the opinion of the laboratory: Items 1-2-1 (CTS Item 2), 1-3-1 (CTS Item 3), and 1-5-1 (CTS Item 5) projectiles could not be identified or eliminated as having been fired by the known firearm that fired item 1-1-1 projectiles (CTS Item 1). These inconclusive conclusions were based on insufficient agreement or disagreement in the patterns of microscopic markings observed between the compared items for conclusions of identification or elimination, respectively. Class Characteristic Elimination: Item 1-4-1 (CTS Item 4) projectile was eliminated as having been fired by the known firearm that fired item 1-1-1 (CTS Item 1) projectiles, based on class characteristic differences.
G6T4X7	The questioned recovered bullets in Item 2, Item3 and Item5 were fired by the same weapon. The questioned recovered bullet in Item 4 was not fired by the suspect's weapon (plygonal LEA).
GA466V	Items 2 and 3 (two bullets) were identified1 as having been fired by the same firearm as Item 1 (said to be three test fired bullets from a "CZ 75 P-07"). Item 4 was not fired by the same firearm as Item 1. It could not be determined if Item 5 was fired by the same firearm as Item 1.2. 1) Source identification is reached when the discernable class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source. 2) The comparative examinations showed

TABLE 2

WebCode	Conclusions
	agreement of individual characteristics, but insufficient for an identification. The comparative examinations were inconclusive.
GHHZY6	2.1. The results of the analysis of (1) fired bullet in item 2, (1) fired bullet in item 3, (1) fired bullet in item 4 and (1) fired bullet in item 5 found that it has (2) groups of individual characteristics. Therefore I think it was fired from (2) guns
GQQQJV	Upon request, a test fired bullet from Item 1 was microscopically examined and compared with the recovered fired bullets, Items 2, 3 and 5. 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 in the same firearm as Item 1. Upon request, a test fired bullet from Item 1 was microscopically examined and compared with the recovered fired bullet, Item 4. Based on the observed disagreement of their class characteristics, Item 4 is eliminated as having been fired in the same firearm as Item 1.
GQUDZ9	The Item 1 test fires lack sufficient details for microscopic comparison. Therefore, a conclusion of inconclusive was determined in regards to the comparison of the Item 1 test fires and Items 2, 3, and 5. The Item 4 bullet has a disagreement of class characteristics from the Item 1 test fires and Items 2, 3, and 5, therefore, the Item 4 bullet was eliminated from being fired from the same firearm as the Item 1 test fires and Items 2, 3, and 5. The Item 2 bullet and the Item 3 bullet were microscopically compared and determined to have sufficient agreement of class and individual characteristics, therefore, the Item 2 and 3 bullets were identified to each other. The Item 5 bullet lacked sufficient details for comparison and a conclusion of inconclusive was determined in regards to the comparison of the Item 5 bullet to the Items 2 and 3 bullets.
GUMJA6	One of the questioned bullets (Item 4) was not fired the same firearm as the remaining questioned bullets (items 2, 3, and 5), or as the test-fired bullets from the CZ 75 P-07 pistol (Item 1). The comparison results were inconclusive if items 2, 3, and 5 were fired in the same firearm as Item 1. The remaining questioned bullets (items 2, 3, and 5) were fired in the same firearm.
GV8ZRR	The four bullets recovered at the scene marked with items 2,3,4 and 5 were not fired by the CZ 75 P-07 pistol.
H2MB6J	Items 2, 3, 4 and 5 were not fired in the same firearm as the Item 1 test fires. Items 2, 3 & 5 were fired in a second firearm. Items 2, 3 & 5 are consistent with bullets from ammunition designated 40 S&W. A list of makes of firearms which are common to the [laboratory] region and may have fired these items includes, but is not limited to: Springfield Armory, FMBUS (Ghost Gun), Beretta, Taurus, Smith & Wesson, Sig Sauer, CZ, and Fabrique Nationale. Item 4 was fired in a third firearm. Item 4 is consistent with a bullet from ammunition designated 40 S&W. A list of makes of firearms which are common to the [laboratory] region and may have fired this item include, but is not limited to: Glock, Kahr Arms, Heckler & Koch, and IMI.
H3JT3E	Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Laboratory Item 1, were identified as having been fired from the same firearm. Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Laboratory Items 2, 3, and 5, were identified as having been fired from the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of individual characteristics, the fired bullets, Laboratory Item 1, could not have been fired from the same firearm as the fired bullets, Laboratory Items 2, 3, and 5. Through macroscopic/microscopic examination and based on significant disagreement of class characteristics, the fired bullet,

TABLE 2

WebCode	Conclusions
	Laboratory Item 4, could not have been fired from the same firearm as the fired bullets, Laboratory Item 1, or from the same firearm as the fired bullets, Laboratory Items 2, 3, and 5.
H8972G	The rifling marks on the Item 4 are too few to identify and deny the identity
H8DLEH	The three known test-fired bullets discharged from the suspect's firearm (item 1) were identified as having been fired from a single firearm, reportedly a CZ 75 P-07. Three questioned recovered bullets (items 2, 3 and 5) were compared to the three known test-fired bullets discharged from the suspect's firearm (item 1). There is agreement in general rifling characteristics (GRC) and disagreement in individual characteristics, but insufficient for elimination; the result of these comparisons is inconclusive. However, the three questioned recovered bullets (items 2, 3 and 5) were identified as having been fired from a single firearm. One questioned recovered bullet (item 4) was eliminated as having been fired from the same firearm(s) as the three known test-fired bullets discharged from the suspect's firearm (item 1) and the three questioned recovered bullets (items 2, 3 and 5). The bullet (item 4) was fired from a 40/10mm caliber firearm with hexagonal rifling and a right twist. Possible firearms include, but are not limited to, firearms chambered for the 40 S&W cartridge manufactured by: Glock; Bersa; Heckler & Koch; IMI; Kahr; Vektor.
HN6E8W	Exhibits 2, 3, and 5 (spent projectiles) were identified as having been fired in the same .40 caliber firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis. Exhibits 2, 3, and 5 were not fired in the same firearm as exhibit 1 (spent projectiles from suspect's firearm), based on differences in individual characteristics. Exhibit 4 (spent projectile) was not fired in the same firearm as exhibits 1, 2, 3, or 5, based on differences in class characteristics. Suspect weapons include .40 caliber Glock pistols; however, any suspect weapon should be submitted to the laboratory for analysis.
HTRDDB	Items 2, 3 and 5 are identified as having been fired in the same unknown firearm. Items 2, 3 and 5 are inconclusive as to having been fired in the firearm that fired item 1 (1A, 1B and 1C) due to a lack/insufficiency of individual characteristics. Item 4 is eliminated from having been fired in the same gun/guns that fired items 1, 2, 3 and 5.
J3FBV4	It is inconclusive whether items 2, 3, and 5 were fired from the same firearm as item 1. Item 4 was not fired from the same firearm(s) that fired items 1, 2, 3, and 5.
J47MGU	Item 1 (A-C) - Three (3) test fired bullets from CZ 75 P-07 firearm (1). Item 2 - One fired bullet, 40 caliber class (2). Item 3 - One fired bullet, 40 caliber class (3). Item 4 - One fired bullet, 40 caliber class (4). Item 5 - One fired bullet, 40 caliber class (5). Examinations Performed: Items 2, 3, 4, and 5 were microscopically examined. Items 1 (A-C), 2, 3, and 5 were microscopically inter-compared. Results: Items 2, 3, and 5 exhibit patterns and markings that are consistent with each other. Items 2, 3, and 5 and Items 1A, 1B, and 1C exhibit patterns and markings that are inconclusive: neither consistent nor inconsistent with each other. Item 4 exhibits patterns and markings that are inconsistent with Items 1A, 1B, and 1C and Items 2, 3, and 5. Conclusions: As a result of microscopic comparison, Items 2, 3, and 5 were identified as having been fired from the same firearm. As a result of microscopic comparison, Items 2, 3, and 5 and Items 1A, 1B, and 1C were inconclusive as having been fired from the same firearm as Items 1A, 1B, and 1C due to damage. Item 4 was eliminated as having been fired from the same firearm as Items 1A, 1B, and 1C and Items 2, 3, and 5 due to differences in class characteristics. Firearms that produce similar rifling characteristics as those exhibited on Item 4 include, but are not limited to, 40S&W caliber firearms manufactured by Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor; and 10mm Auto firearms manufactured by

TABLE 2

WebCode	Conclusions
	Glock.
J4TXDH	The one projectile (Ex.2) was compared macroscopically and microscopically to the test fired projectiles (Ex.1). Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that the projectile (Ex.2) was fired out of the CZ pistol (Ex.1). (Identification). The one projectile from Ex.3 and the one projectile from Ex.5 were compared macroscopically and microscopically to the test fired projectiles from Ex.1. Although the projectiles have similar class characteristics; it was not possible to identify or eliminate these projectiles (Ex.3 and Ex.5) as having been fired from the CZ pistol (Ex.1). (Inconclusive). The projectile (Ex.3) and the projectile (Ex.5) were compared to each other. Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that the projectile (Ex.3) and projectile (Ex.5) were fired out of the same firearm. (Identification). The one projectile (Ex.4) was compared macroscopically and microscopically to the test fired projectiles (Ex.1). Due to differing class characteristics, it is not possible for the projectile (Ex.4) to have been fired out of the CZ pistol (Ex.1). (Elimination). The projectile (Ex.4) could not have fired out of the same firearm as Ex.2, Ex.3 and Ex.5 due to differing class characteristics. (Elimination).
J68DVP	Bullet Analysis: Methodology: Physical (Visual Examination). Electronic Balance/Digital Caliper/Digital Micrometer. Microscopy (Comparison Microscope). Items 2, 3, 4 and 5 are 40 caliber class bullets based upon the diameter. Items 2, 3, 4 and 5 are consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style. Items 2, 3 and 5 exhibit characteristics found in (but not limited to) the following firearms: Beretta, Ceska Zbrojovka, SigArms and Taurus .40 S&W caliber firearms. Item 4 exhibits characteristics found in (but not limited to) the following firearms: Glock 10mm Auto caliber firearms; Bersa, Glock, Heckler & Koch and Kahr Arms .40 S&W caliber firearms. Items 2, 3 and 5, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Comparisons between Items 2, 3 and 5, the bullets, and bullets test fired through the barrel of .40 S&W caliber CZ model 75 P-07 firearm, were inconclusive due to insufficient corresponding individual microscopic characteristics. Item 4, the bullet, was not fired through the barrel of the same firearm as Items 2, 3 and 5, the bullets, nor the barrel of the .40 S&W caliber CZ model 75 P-07 firearm, based upon different class characteristics.
J7T7HR	The comparative microscopic examination of the bullets (Nr.: 2, 3, 4, 5) with the comparison ammunition material (Nr.: 1) obtained here, shows agreement in the system features on the bullets Nr.: 2, 3 and 5 (imprints of the internal barrel profile) However, due to the quality and quantity of the individual traces of firing on the “actual bullets”, an individual assignment or exclusion is not possible. Due to different system characteristics on projectile number 4, it can be ruled out that this projectile passed through the barrel of the weapon in question.
J8RAB3	The bullets identified as items "2, 3, 4, 5" were not fired by the same firearm that fired the bullets identified as item "1".
J92GEV	Examinations to determine whether Items 2, 3, and 5 were discharged from the same firearm as Item 1 were inconclusive due to a lack of sufficient matching or differing individual characteristics and a lack of differing class characteristics. Examinations showed that Item 4 was not discharged from the same firearm as Item 1. Examinations showed that Items 2, 3, and 5 were discharged from the same firearm.
JBLDUA	The test fired bullets in Item 1 were microscopically examined in conjunction with the bullets in Items 2-5 (4 total). Based on these comparative examinations and observed class and

TABLE 2

WebCode	Conclusions
	individual characteristics, it was determined that: A) The bullets in Items 2, 3, and 5 bear the same class characteristics as test fired bullets from Item 1; however, there are insufficient individual characteristics for a more conclusive determination at this time. B) The bullets in Items 2, 3, and 5 had all been fired in the same firearm. C) The bullet in Item 4 bears different class characteristics as the test fired bullets in Item 1 and the bullets in Items 2, 3, and 5. Therefore, Item 4 had been fired in a different firearm than these bullets.
JJP7JW	Due to a difference in class characteristics submission 001-3 is concluded to have been excluded from having the same source as submissions 001-1, 001-2, and 001-4 (source exclusion). Submissions 001-1, 001-2, and 001-4 were microscopically compared. Submissions 001-1, 001-2, and 001-4 exhibit the same general rifling class characteristics; however, the result of the microscopic comparison was inconclusive due to the lack of sufficient suitable corresponding microscopic markings. It was not possible to identify or eliminate submissions 001-1, 001-2, and 001-4 as having been fired in the same firearm. Due to a difference in class characteristics submission 001-3 is concluded to have been excluded from having the same source as submissions 001-5 test fires (produced by CTS in a 40 S&W CZ 75 P-07) (source exclusion). Submissions 001-1, 001-2, and 001-4 were microscopically compared to submission 001-5 test fires (produced by CTS in a 40 S&W CZ 75 P-07). Submissions 001-1, 001-2, and 001-4 exhibit the same general rifling class characteristics as those of the Submission 001-5 test fires (produced by CTS in a 40 S&W CZ 75 P-07); however, the result of the microscopic comparison was inconclusive due to the absence, insufficient detail, and lack of reproducibility of individual corresponding microscopic markings. It was not possible to identify or eliminate submissions 001-1, 001-2, and 001-4 as having been fired from the same firearm as submission 001-5 test fires (produced by CTS in a 40 S&W CZ 75 P-07).
JJZ6K8	Results of Examinations: Item 1 consists of three (3) .40 caliber test-fired bullets. Item 2, Item 3, and Item 5 consist of three (3) .40 caliber bullets that were fired from a barrel rifled with six grooves, right twist. Item 4 consists of one (1) .40 caliber bullet that was fired from a polygonal-rifled barrel with right twist. The Item 2, Item 3, and Item 5 bullets were identified as having been fired from the same barrel. A pattern examination of the Item 2, Item 3, and Item 5 bullets and Item 1 test-fired bullets was inconclusive due to insufficient quality and/or quantity of corresponding individual characteristics. The Item 4 bullet was excluded as having been fired from the same barrel as the Item 1 test-fired bullets or the same barrel as the Item 2, Item 3, and Item 5 bullets.
JZAWJV	Items 2, 3, and 5 were microscopically intercompared. These bullets have the same class of rifling and sufficient corresponding individual microscopic marks to conclude that they were fired in a single firearm. Items 2, 3, and 5 were also microscopically compared to the test-fired bullets in Item 1. While there are similar class marks, there are significant differences in individual marks. In the absence of alteration, the Items 2, 3, and 5 bullets were not fired in the firearm associated with the Item 1 test-fires. There are significant differences in rifling class marks between Item 4 and Items 2, 3, 5, and the Item 1 test-fired bullets. The Item 4 bullet was not fired in the firearm associated with the Item 1 test-fires nor the firearm associated with Items 2, 3, and 5.
K3VX2P	Bullet Analysis: Methodology: Physical (Visual Examination). Electronic Balance/Caliper/Digital Micrometer. Microscopy (Comparison Microscope). Items 2, 3, 4, and 5 are 40 caliber class bullets based upon the diameter. Opinion/Interpretation: Items 2, 3, and 5 are consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style. These bullets exhibit characteristics found in (but not limited to) the following firearms: Beretta,

TABLE 2

WebCode	Conclusions
	Ceska Zbrojovka, Heritage, Czechoslovakia, SIGARMS, Smith & Wesson, Steyr, and Taurus .40 S&W caliber firearms. Opinion/Interpretation: Item 4 is consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based upon the weight and style. This bullet exhibits characteristics found in (but not limited to) the following firearms: caliber Bersa, Glock, Heckler & Koch, IMI, Kahr Arms .40 S&W caliber firearms; Glock 10mm Auto caliber firearms Items 2, 3, and 5, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 5, the bullets, were not fired through the barrel of the same firearm as Item, 4, the bullet, based upon different class characteristics. Comparisons between Items 2, 3, and 5, the bullets, and bullets identified to be test fired through the barrel of Item 1, a CZ pistol, were inconclusive due to insufficient corresponding individual microscopic characteristics. Item 4, the bullet, was not fired in Item 1, the CZ pistol, based upon different class characteristics.
K4L9QW	Item #1 test fires were microscopically examined and compared to Items #2, #3, and #5. 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. Items #2, #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 #2, #3, and #5 are identified as having been fired from the same firearm. Item #4 was microscopically examined and compared to Item #1 test fires and Items #2, #3, and #5. Based on the observed disagreement of class characteristics, Item #4 is eliminated as having been fired from the same firearm(s) as Item #1 test fires and Items #2, #3, and #5.
K6EYWB	ITEM 2,3, 5 WERE FIRED FROM A SAME PISTOL, PROBABLY DIFFERENT FROM SUSPECT'S FIREARM. ITEM 4 WAS FIRED FROM A THIRD FIREARM, DIFFERENT FROM SUSPECT'S PISTOL.
KMW8NY	[No Conclusions Reported.]
KMZM77	1. A microscopic comparative examination of Bullet Specimens B-1 (Item#2), B-2 (Item#3) and B-4 (Item#5) against each other and Pistol P-1 (Item#1), disclosed that these items exhibit the same class characteristics, however, there were insufficient individual corresponding microscopic markings to permit a positive identification (Inconclusive). 2. Bullet B-3 (Item#4) was not discharged from Pistol P-1 (Item#1), due to differences in class characteristics.
KPN4DT	1. Questioned recovered bullets (items 2, 3 and 5) were dischared from the same firearms as the known test-fired bullets (items 1). 2. It could not be determined wheter or not questioned recovered bullet (item 1) was dischared from the same firearms as the known test-fired bullets (items 1).
KW4MV8	item 1= item 2, item 3, item 5
KYT6YD	Examinations showed Items 2, 3, 4 and 5 were not discharged from the same firearm as Item 1.
L2CFBN	After physical and microscopic examination, it is my opinion that: A) Identification. The spent projectiles in Items 1-2, 1-3 and 1-5 were all fired from the same unknown weapon capable of discharging .40 caliber class ammunition. B) Exclusion. The spent projectiles in Items 1-2, 1-3 and 1-5 were not fired from the suspect weapon that fired the test fires in Item 1-1. C) Exclusion. The spent projectile in Item 1-4 was not fired from the suspect weapon that fired the test fires in Item 1-1 or the unknown weapon that fired Items 1-2, 1-2 and 1-5.

TABLE 2

WebCode	Conclusions
L6WEG7	1. A) Items identified as JP1 and JP4 “Evidence” bullet cases, were fired by the same firearm. B) Items identified as JP2 and JP3 “Evidence” bullet cases, were not fired by the same firearm. 2. A) Items identified as JP1 and JP4 “Evidence” bullet cases, was fired by the CZ 75 P-07 Pistol, based on the agreement of class an individual characteristics with the test fires from this pistol (Items JPT1A, JPT1B and JPT1C). B) Items identified as JP2 and JP3 “Evidence” bullet cases, were not fired by the CZ 75 P-07 Pistol, based on the disagreement of individual characteristics with the test fires from this pistol (Items JPT1A, JPT1B and JPT1C).
LB269C	The Item 01-01A through 01-01C fired bullets were fired from the same firearm, reportedly a CZ model 75 P-07 pistol. The Item 01-02, 01-03, and 01-05 fired bullets were identified as being fired from the same unknown firearm. The Item 01-04 fired bullet was eliminated as being fired from the same firearms as Items 01-01, 01-02, 01-03, and 01-05 due to differences in class characteristics. The Item 01-02, 01-03, and 01-05 fired bullets could not be identified or eliminated as being fired from the same firearm as Item 01-01 due to having similar class characteristics, but a lack of repeating patterns of individual characteristics.
LCVX4V	Items 2, 3, and 5 were microscopically intercompared, finding class and individual distinguishing characteristic correspondence. It was concluded that Items 2, 3, and 5 were all fired by the same firearm (firearm not submitted). Items 2, 3, and 5 were microscopically compared with test fired specimens, Item 1, finding class characteristic correspondence. It was concluded that Item 2, Item 3, and Item 5 could not be identified to nor excluded from having been fired by the same firearm as the Item 1 bullets. Damage, poor quality markings, and poor reproduction observed on Items 1, 2, 3, and 5 were limiting factors in the analysis. Items 1, 2, 3, and 5 were microscopically compared to Item 1D, finding class characteristic differences. It was concluded that Item 4 was fired by a different firearm than Items 1, 2, 3, and 5 (firearm not submitted).
LDNNAA	The Items 2, 3, and 5 bullets were identified as having been fired from the same unknown firearm as a result of the significant agreement of individual characteristics. The bullets were eliminated as having been fired from the same firearm as the Item 1 bullets (designated 1A through 1C) due to significant differences in individual characteristics. The Item 4 bullet was eliminated as having been fired from the same firearm as the Items 1 (designated 1A through 1C), 2, 3, and 5 bullets due to differences in class characteristics.
LDPLK6	1. The recovered bullets identify as Item 2, Item 3 and Item 5 belong to the .40" caliber and were fired by the same firearm that generated Item 1, 2. The recovered bullet identify as Item 4 belong to the caliber .40" / 10 mm and was not fired with the gun that generted Item 1 which corresponds to the firearm CZ brand, 75 P-07 model, .40" caliber S&W.
LHGZZY	2.1 Three known test-fired bullets discharged from the suspect's firearm in item 1 have similarity of individual characteristics with (1) fired bullet in item 2, (1) fired bullet in item 3 and (1) fired bullet in item 5.
LMEDNP	Las balas testigo marcadas como indicio 1, no presentan características individuales con las balas dos 2, tres 3, cuatro 4 y cinco 5. La bala marcada como indicio cuatro 4 fue disparado por un arma de fuego desconocida. Las balas marcadas como indicio dos 2, indicio tres 3 e indicio cinco 5, fueron disparados por una misma arma de fuego desconocida. The witness bullets marked as indication 1 do not present individual characteristics with bullets two 2, three 3, four 4 and five 5. The bullet marked clue four 4 was fired from an unknown firearm. The bullets marked as indication two 2, indication three 3 and indication five 5, were fired from the same unknown firearm.

TABLE 2

WebCode	Conclusions
M329JC	Identification: Items #2, 3 & 5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of individual characteristics, items #2, 3 & 5 are all identified as having been fired by one gun. Elimination: Items #2, 3 & 5 were microscopically examined and compared to item #1 (test specimens from a CZ75 P07 pistol) & item #4. Based on the disagreement of class and or individual characteristics, items #2, 3 & 5 are eliminated as having been fired by the same firearm as items #1 & 4. Elimination: Item #4 was microscopically examined and compared to item #1 (test specimens from a CZ75 P07 pistol) & items #2, 3 & 5. Based on the disagreement of class and or individual characteristics, item #4 is eliminated as having been fired by the same firearm as items #1, 3, 3 & 5.
M3NTCQ	Exhibits 2, 3 and 5 (spent projectiles) were identified as having been fired in the same .40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis. Exhibits 2, 3, and 5 were not fired in the same firearm that produced exhibit 1 (spent projectiles from suspect's firearm) based on differences in individual characteristics. Exhibit 4 (spent projectile) was not fired in the same firearm as exhibits 1, 2, 3 or 5, based on differences in class characteristics. Suspect weapons include .40 caliber Glock pistols; however, any suspect weapon should be submitted to the laboratory for analysis.
M7QG9F	The projectile in Item 4 was not fired in the gun that fired the projectiles in Item 1, based on differences observed in class characteristics. The projectiles in Items 2, 3 and 5 bear class characteristics consistent with the projectiles in Item 1. However, due to insufficient reproducible individual characteristics, the projectiles in Items 2, 3 and 5 could not be positively included or excluded as having been fired in the same gun that fired the projectiles in Item 1.
MBW8BL	ITEM 2, 3, and 5: These bullets were inconclusive to each other, and to the Item 1 bullets, based on a lack of corresponding individual characteristics. ITEM 4: This bullet was eliminated from the Item 1, 2, 3, and 5 bullets.
MG99FP	Items A-2, A-3, and A-5 (fired bullets). Microscopic comparison of these fired bullets and test-fired bullets from the CZ pistol revealed that they have similar class of rifling, but do not have agreement or disagreement of individual marks. These bullets could not be identified or eliminated as having been discharged in the same firearm. The findings are inconclusive. The bullets in items A-2, A-3, and A-5 were also microscopically intercompared, revealing that while they have similar class of rifling, they do not have agreement or disagreement of individual marks. These bullets could not be identified or eliminated as having been fired in the same firearm. Item A-4 (fired bullet) Microscopic comparison of this fired bullet and a test-fired bullet from the CZ pistol revealed significant differences in class of rifling marks. This bullet was discharged in a different firearm.
MGNGKJ	RESULTS: PROJECTILES Items 2, 3, and 5: These bullets were Eliminated from Item 1. They were Identified to each other. They are 40/10mm caliber class. There are numerous manufacturers of firearms with similar rifling characteristics. Item 4: This bullet was Eliminated from Items 1, 2, 3, and 5 based on a difference in class characteristics. This bullet is 40/10mm caliber class and displays rifling characteristics typical of firearms by Glock and Heckler & Koch, among possible others.
MJQEVC	Items 2, 3, and 5, each consistent in design with a caliber 40 Smith & Wesson bullet, were microscopically examined and identified as having been fired from the same firearm based on corresponding class and individual characteristics. Items 2, 3, and 5 exhibit similar class

TABLE 2

WebCode	Conclusions
	characteristics as those present on the Item 1 bullets. Items 2, 3, and 5 were compared to the Item 1 bullets and the result was inconclusive. There is some disagreement of individual characteristics; however, it is insufficient for an elimination. Item 4, consistent in design with a caliber 40 Smith & Wesson bullet, was microscopically examined and eliminated as having been fired from the same firearm(s) as the Item 1 bullets and the Item 2, 3, and 5 bullets due to differences in class characteristics.
MKJEMV	The Q1, Q2, & Q4 fired bullets were microscopically examined and found to contain sufficient markings to determine that they were fired from the K1 firearm. The Q3 fired bullet was microscopically examined and eliminated as having been fired from the K1 firearm due to different rifling methods (class characteristic).
MTCKMN	Upon request, a test fired bullet, Item 1.A, was microscopically examined and compared with a recovered fired bullet, Item 4. Based on the observed disagreement of their class characteristics, Item 4 is eliminated as having been fired from the same firearm as Item 1.A. Upon request, test fired bullets, Items 1.A-1.C, were microscopically examined and compared with recovered fired bullets, Items 2, 3 and 5. There is observed agreement of their class characteristics. However, there is insufficient agreement or disagreement of their individual characteristics to either identify or eliminate Items 2, 3 and 5 as having been fired from the same firearm as Items 1.A-1.C.
MW2PJ3	[No Conclusions Reported.]
MWFBVP	The 40 caliber class bullets (Items 2, 3, and 5) were fired from one firearm. The 40 caliber class bullet (Item 4) was fired from a second firearm. None of the 40 caliber class bullets (Items 2, 3, 4, and 5) were fired from the same firearm as the submitted test fires (Item 1).
MXTVVL	items 2-3-5 were fired from a second weapon item 4 was fired from a third weapon
MY98KJ	Items 2 through 5 were not fired in the same firearm as the item 1 test fires. Items 2, 3 and 5 were fired in a second firearm. Items 2, 3 and 5 are consistent with bullets from ammunition designated 40 S&W. A list of makes of firearms that may have fired these items includes, but is not limited to: Beretta, Ceska Zbrojovka, Sigarms, Smith & Wesson and Taurus. Item 4 was fired in a third firearm. Item 4 is consistent with a bullet from ammunition designated 40 S&W or 10mm Auto. A list of makes of firearms that may have fired this item includes, but is not limited to: Glock, and Heckler and Koch.
N4UKWQ	Item 1 consists of three (3) fired 40/10mm class caliber full-metal copper-jacketed bullets that were fired from a known firearm with a barrel rifled with six (6) lands and grooves, right twist. The Item 1 bullets were each given additional characters for differentiation (1a, 1b, and 1c). The Item 1 bullets were microscopically compared to each other and determined to have reproducible individual markings. Items 2, 3, and 5 are three (3) fired 40/10mm class caliber full-metal copper-jacketed bullets that were fired from a barrel(s) rifled with six (6) lands and grooves, right twist. Item 4 is one (1) fired 40/10mm class caliber full-metal copper-jacketed bullet that was fired from a barrel rifled with polygonal rifling with six (6) lands and grooves, right twist. Item 4 was eliminated as being fired from the same firearm(s) as the known Item 1 test fires and the Items 2, 3, and 5 bullets due to significant disagreement of class characteristics. Items 2, 3 and 5 were microscopically compared to the known Item 1 test fires and to each other, and they could not be identified or eliminated as having been fired from the same firearm as the known Item 1 test fires due to agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for an elimination. (See Appendix 2C) [Appendix not provided]. Items 2, 3 and 5 could not be identified or

TABLE 2

WebCode	Conclusions
	eliminated as being fired from the same firearm(s) as each other due to agreement of all discernible class characteristics and some agreement of individual characteristics, but insufficient for an identification. (See Appendix 2A) [Appendix not provided].. Firearms that produce rifling characteristics like those exhibited on the Items 2, 3, 4 and 5 bullets are included in the FBI's General Rifling Characteristics lists that will accompany this report. Please note that these lists are not all inclusive.
N7EFC4	that bullets 2, 3 and 5 were fired by the same firearm, from which the patterns were taken.
N8F7QY	[No Conclusions Reported.]
NCA4E6	The below listed spent bullets were macroscopically and microscopically examined and compared with test fires (Lab Evidence# 001-A1) from the CZ 40S&W pistol, and with each other. These items could neither be identified nor eliminated as having been fired from this firearm, or the same firearm (inconclusive). Lab Evidence# Item# Item Description 001-A2 2 Spent 40 caliber bullet 001-A3 3 Spent 40 caliber bullet 001-A5 5 Spent 40 caliber bullet The below listed spent bullet was macroscopically and microscopically examined and compared with test fires (Lab Evidence# 001-A1) from the CZ 40S&W pistol, and with the above listed bullets. It is my opinion that this item was not fired from the same firearm(s) (elimination). Lab Evidence#: Item#: Item Description: 001-A4 4 Spent 40 caliber bullet. [Participant submitted data in a format that could not be reproduced in this report]
NCPJ7C	The recovered bullets (item2 ,3 & 5) were discharged from the same firearms, but it is not the firearm as the known test-fired bullets (item 1).
NPELP6	The item 1-2, 1-3, and 1-5 bullets are inconclusive as having been fired in the same firearm as the item 1-1A through 1-1C bullets. There is agreement in all discernable class characteristics without agreement or disagreement in individual characteristics due to an absence, insufficiency, or lack of reproducibility. The item 1-2, 1-3, and 1-5 bullets are identified as having been fired in the same unknown firearm. The item 1-4 bullet is eliminated as having been fired in the same firearm as the item 1-1A through 1-1C bullets or the item 1-2, 1-3, and 1-5 bullets.
NRZ48P	Based on an agreement of class characteristics and neither sufficient agreement nor sufficient disagreement of individual characteristics, the Exhibits 1, 2, 3, and 5 caliber 40 S&W/10mm Auto bullets could not be identified or excluded as having been fired from the same firearm. The result of the comparison was inconclusive. The Exhibit 4 caliber 40 S&W/10mm Auto bullet was excluded as having been fired from the same firearm(s) as the Exhibit 1, 2, 3, and 5 bullets.
NY2KFA	The evidence in items 1 through 5 was analyzed by physical and microscopic examination. The three bullets in items 2, 3, and 5 were .40/10mm bullets which had been fired from the barrel of a weapon rifled with six lands and grooves, right twist. The bullet in item 4 was a .40/10mm bullet which had been fired from the barrel of a weapon rifled with polygonal type rifling. The four bullets in items 2, 3, 4, and 5 were determined not to have been fired from the same weapon as the three known bullets in item 1. The three bullets in items 2, 3, and 5 were fired from one weapon. The bullet in item 4 was fired from a different weapon than the three bullets in items 2, 3, and 5. Further analysis is pending submission of two weapons for additional comparisons. Item 1 was used for comparison.
P93Z6E	The Items 2, 3, and 5 fired bullets could not be identified or eliminated as being fired from the same known firearm that fired the Item 1 test fired bullets. These inconclusive results are based

TABLE 2

WebCode	Conclusions
	on insufficient quantity and quality of individual characteristics present due to some areas of damage on the Item 1 tests as well as slight variation in land and groove impression widths between tests and evidence. However, Items 2, 3, and 5 as well as the Item 1 test fires have similar class characteristics including 40 caliber family, conventional rifling with a right hand twist, and 6 land and groove impressions of similar widths. The Items 2, 3, and 5 fired bullets were fired from the same unknown firearm. These identifications are based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. The Item 4 fired bullet was not fired from the same known firearm that fired the Item 1 test fired bullets. This elimination is based on differences in class characteristics (rifling type). The Item 4 fired bullet was not fired from the same unknown firearm that fired the Items 2, 3, and 5 fired bullets. These eliminations are based on differences in class characteristics (rifling type). Item 4 is a 40 caliber family fired bullet having six polygonal land and groove impressions with a right hand twist. An Association of Firearm and Tool Mark Examiners (AFTE) General Rifling Characteristics Database search of possible firearms that could have fired Item 4 is attached. Note: The attached GRC search [search not provided] may not be all-inclusive; any recovered firearms of the appropriate caliber class may be submitted to the laboratory for comparison purposes.
PAWQBU	None of the questioned samples had beeen fired out of the same barell than the known samples. Item 4 shows different class characteristics. Items 2, 3 and 5 shows the same class characteristics but differences in individual marks.
PAWZWY	[No Conclusions Reported.]
PC7VPH	1. Examination of Exhibit 1 revealed three fired bullets consistent with those loaded in a 40 S&W cartridge. 2. Examination of Exhibits 2, 3, 4, and 5 each revealed one fired bullet consistent with those loaded in a 40 S&W cartridge. 3. Microscopic examination revealed: A. Exhibits 2, 3, and 5 were fired in the same firearm due to sufficient agreement of individual characteristics. B. Exhibits 2, 3, and 5 were not fired in the same firearm as Exhibit 1 due to sufficient disagreement of individual characteristics. C. Exhibit 4 was not fired in the same firearm as Exhibits 2, 3, and 5 or Exhibit 1 due to disagreement of class characteristics.
PCM2Z2	Results of Examinations: Item 1 is reported to be three test fires from a .40 S&W CZ pistol, Model P-07. Item 2, 3, and 5 are .40 caliber/10mm full metal jacket bullets that were fired from a barrel rifled with six grooves, right twist. The Item 2, 3, and 5 bullets were identified as having been fired from the same barrel. A pattern examination of the Item 2, 3, and 5 bullets and Item 1 pistol was inconclusive due to insufficient quality and/or quantity of corresponding individual characteristics. A check of the [Laboratory] General Rifling Characteristics (GRC) database produced a list of pistols with GRCs like those present on the Item 2, 3, and 5 bullets that includes pistols marketed by Beretta, CZ, SigArms, Smith & Wesson, and Taurus. Item 4 is a .40 caliber/10mm full metal jacket bullet that was fired from a polygonal barrel rifled with six grooves, right twist. The Item 4 bullet was excluded as having been fired from the barrel of the 1 pistol and the barrel that fired the Item 2, 3, and 5 bullets due to a difference in class characteristics. A check of the [Database] produced a list of pistols with GRCs like those present on the Item 4 bullet that includes pistols marketed by Glock, IMI, Kahr Arms, Bersa and Heckler & Koch.
PDEBVN	The Exhibit 1 40 caliber class bullets are purported test fires recovered from a CZ 75 P-07 pistol. The Exhibit 1 bullets could not be identified or excluded as having been fired from the same firearm based on an agreement of all discernible class characteristics but a lack of sufficient agreement or sufficient disagreement of individual characteristics. (Inconclusive)

TABLE 2

WebCode	Conclusions
	Exhibits 2 through 5 each contain one 40 caliber class bullet. The Exhibit 4 bullet was excluded as having been fired from the same firearm as the Exhibit 1, Exhibit 2, Exhibit 3, or Exhibit 5 bullets. (Source exclusion) The Exhibit 3 and Exhibit 5 bullets were identified as having been fired from the same firearm. (Source identification) The Exhibit 3 and Exhibit 5 bullets could not be identified or excluded as having been fired from the same firearm as the Exhibit 1 or Exhibit 2 bullets based on an agreement of all discernible class characteristics but a lack of sufficient agreement or sufficient disagreement of individual characteristics. (Inconclusive) The Exhibit 2 bullet could not be identified or excluded as having been fired from the same firearm as the Exhibit 1 bullets based on an agreement of all discernible class characteristics but a lack of sufficient agreement or sufficient disagreement of individual characteristics. (Inconclusive) Firearms that produce general rifling characteristics similar to those observed on Exhibit 4 include, but may not be limited to, caliber 40 S&W pistols marketed by Bersa, Glock, H&K, IMI, Kahr Arms, and Vektor, as well as caliber 10mm Auto pistols marketed by Glock. Firearms that produce general rifling characteristics similar to those observed on Exhibits 2, 3, and 5 include numerous makes and models.
PFHT9X	Tool marks on Item 02, Item 03, and Item 05 are agreed with the tool marks on the Test bullets in Item 01.
PNYJFB	Suspect's firearm (semi-automatic pistol) CZ 75 P-07 fired Item 2, 3 and 5 Item 4 with a fired bullet of calibre 0.40 inch was not fired from suspect's fire arm
PQ3DEF	Items 2, 3, 4, and 5 were not fired in the same firearm as the item 1 testfires. Items 2, 3, and 5 were fired in a second firearm. Items 2, 3, and 5 are consistent with bullets from ammunition designated 10mm Auto or 40 S&W. A list of makes of firearms that may have fired these items includes, but is not limited to: Sigarms, Iberia Arms, Steyr-Mannlicher, Ceska Zbrojovka (CZ), KSN Industries, Smith & Wesson, Beretta, Taurus, and Heritage. Item 4 was fired in a third firearm. Item 4 is consistent with a bullet from ammunition designated 10mm Auto or 40 S&W. A list of makes of firearms that may have fired this item includes, but is not limited to: Glock, Heckler and Koch, IMI, Kahr Arms, Vektor and Bersa.
Q6X4NJ	Item 2 was fired in the Item 1 pistol due to agreement of all discernible class characteristics and sufficient agreement in individual characteristics. Items 3, 4, and 5 were not fired in the Item 1 pistol due to a significant disagreement in individual characteristics. Items 3 and 5 were fired in the same unknown firearm due to agreement of all discernible class characteristics and sufficient agreement of individual characteristics. Items 3 and 5 were not fired in the same unknown firearm as Item 4 due to a significant disagreement in individual characteristics.
Q8QM2H	Item 2, Item 3, and Item 5 were not fired from the CZ 75 P-07 pistol that fired Item 1 due to the differences in individual characteristics present. Item 2, Item 3 and Item 5 were fired with the same unknown firearm based on sufficient agreement of individual characteristics present. Item 4 was not fired with the same firearm that fired Item 2, Item 3 and Item 5 due to the differences in class characteristics present (polygonal rifling). Item 4 was not fired from the CZ 75 P-07 pistol that fired Item 1 based on differences in class characteristics (polygonal rifling).
QAUPFL	Fired bullets items 2, 3 and 5 were fired by the same firearm used to fire items number 1. Item number 4 was eliminated by class characteristics.
QBMCHP	Examinations showed the class characteristics of Item 2, Item 3 and Item 5 to be consistent with Item 1 with respect to the width and number of the lands and grooves and direction of rifling twist; however, examinations to determine if Item 2, Item 3 and Item 5 were discharged from Item 1 were inconclusive due to the lack of sufficient agreement or disagreement of the individual characteristics and mutilation. Examinations showed that Item 4 was not discharged

TABLE 2

WebCode	Conclusions
	from the same firearm as the known test-fired bullets from (Item 1).
QGRBTF	Items 2 through 5 were not fired in the same firearm as the item 1 test fires. Items 2, 3 and 5 were fired in a second firearm. Items 2, 3 and 5 are consistent with bullets from ammunition designated 40 S&W. A list of makes of firearms which are common to the [laboratory] region and may have fired this item includes, but is not limited to: FMBUS/Ghost Gun, Springfield Armory, Taurus, Beretta, Ruger, Smith & Wesson, and Heckler & Koch. Item 4 was fired in a third firearm. Item 4 is consistent with a bullet from ammunition designated 40 S&W or 10mm Auto. A list of makes of firearms which are common to the [laboratory] region and may have fired this item includes, but is not limited to: Glock, Kahr Arms, and Heckler & Koch.
QJHJRH	El arma de fuego CZ 75 P-07 disparo a las balas identificadas como indicios "2" y "5". [Translation not provided at time of publication.]
QMFVWV	The questioned recovered bullets labeled "Item 2", "Item 3", "Item 4" and "Item 5" were NOT discharged from the same firearm as the known test-fired bullets (Item 1).
R396W7	Items 2 and 3 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner ___. Items 2 and 3 could not be identified or eliminated as having been fired in the same firearm as Item 1 (inconclusive). This is also the opinion of Firearms Examiner ___. Item 5 could not be identified or eliminated as having been fired in the same firearm as Item 1 (inconclusive). This is also the opinion of Firearms Examiner ___. Item 5 could not be identified or eliminated as having been fired in the same firearm as Item 2 and Item 3 (inconclusive). This is also the opinion of Firearms Examiner ___. Item 4 was not fired in the same firearm(s) as Item 1, Item 2, Item 3, or Item 5 (elimination). This is also the opinion of Firearms Examiner ___.
R6WL9Z	The CZ pistol, specimen #1, was test fired using material from the laboratory collection and was operable as received. Reference fired projectiles obtained from specimen #1 were microscopically compared to the unknown caliber copper jacketed projectiles in specimens #2 through #5, which revealed the following results: Specimens #2 through #5 were consistent with .40 caliber class ammunition (which includes .40 S&W). Specimens #2, #3, and #5 possessed the same rifling characteristics, as well as sufficient reproducing individual markings to one another and the reference fired projectiles in specimen #1 and were determined to have been fired in the same weapon. Specimen #4 possessed different rifling characteristics than specimens #2, #3, #5, and the reference fired projectiles in specimen #1 and was fired from a different weapon.
R83TRR	Item 001-01 test fired bullets were microscopically examined in conjunction with Items 001-02, 001-03, 001-04 and 001-05 fired bullets. Based on these comparative examinations it was determined that: A. Items 001-02, 001-03, and 001-5 fired bullets were inconclusive as having been fired through the same barrel as Item 001-01 test fired bullets based on insufficient agreement or disagreement of individual characteristics. B. Item 001-04 fired bullet was eliminated as having been fired through the same barrel as Item 001-01 test fired bullets.
R8NDK7	The Items 01-01 bullets were identified as having been fired from the same firearm, which is reportedly a 40 caliber class CZ brand pistol, Model P-07. The Items 01-02, 01-03, and 01-05 bullets were identified as having been fired from the same unknown firearm as one another. The Items 01-02, 01-03, and 01-05 bullets were unable to be identified or eliminated as having been fired from the same firearm as the Item 01-01 bullets due to a lack of reproducible marks. The Item 01-04 bullet was eliminated as having been fired in the same firearm(s) as the Items 01-01, 01-02, 01-03, and 01-05 bullets. The Item 01-04 bullet is 40 caliber class and was fired from an unknown firearm with six polygonally rifled lands and

TABLE 2

WebCode	Conclusions
	grooves inclined to the right. The 40 caliber class includes, but is not limited to, 40 S&W and 10mm Auto. Possible manufacturers of the unknown firearm that fired this bullet include, but are not limited to, Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor
RACUWY	The Item 2, 3, and 5 projectiles were microscopically compared and determined to have similar class characteristics and sufficient agreement of individual characteristics for an identification. In the opinion of the examiner Items 2, 3, and 5 were fired from the same firearm. The Item 2, 3, and 5 projectiles were microscopically compared with the Item 1 test fired projectiles and determined to have similar class characteristics but lack sufficient agreement or disagreement of individual characteristics for an identification or elimination. In the opinion of the examiner Items 2, 3, and 5 cannot be identified or eliminated as being fired from the same firearm which fired the Item 1 test fired projectiles. The Item 4 projectile was compared with the Item 1 test fired projectiles and determined to have disagreement of class characteristics. In the opinion of the examiner the Item 4 projectile was not fired in the same firearm which fired the Item 1 test fired projectiles. The Item 2, 3, and 5 projectiles were compared with the Item 4 projectile and determined to have disagreement of class characteristics. In the opinion of the examiner the Item 4 projectile was not fired from the same firearm which fired Items 2, 3, and 5.
RFTKZ7	Examinations showed Items 2, 3, 4, and 5 were not discharged from the same firearm at Item 1 due to the differences of the class or individual characteristics.
RJVFRL	Exhibits 2, 3 and 5 (spent projectiles) were identified as having been fired in the same .40 caliber firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted for examination. Exhibits 2, 3, and 5 were not fired in the same firearm as exhibit 1 (spent projectiles form suspect's firearm), based on differences in individual characteristics. Exhibit 4 (spent projectile) was not fired in the same firearm as exhibits 1, 2, 3, or 5 based on differences in class characteristics. Suspect weapons include .40 caliber Glock pistols; however, any suspect weapon should be submitted for examination.
RUEVUN	RESULTS: The Item 2, 3 and 5 bullets were Identified to each other. The Item 2, 3 and 5 bullets were Inconclusive (-) to the Item 1 bullets. The Item 2, 3 and 5 bullets are 40/10mm caliber class based on design features and they display rifling characteristics similar to firearms by Beretta, CZ, Sigarms and Taurus, among others. The Item 4 bullet was Eliminated from the Item 1 bullets based on difference in class characteristics. The Item 4 bullet was Eliminated from the Item 2, 3 and 5 bullets based on difference in class characteristics. The Item 4 bullet is 40/10mm caliber class based on design features and it displays rifling characteristics similar to firearms by Glock, H&K, IMI and Kahr Arms, among others. REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Inconclusive (-): Agreement of all discernible class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the

TABLE 2

WebCode	Conclusions
	conclusion that the items were not fired in/from the same firearm.
T34PJ7	Items 2, 3, 4, and 5 have physical and design characteristics consistent with being .40/10mm caliber. No list was established of firearms that could have possibly fired Items 2, 3, 4, and 5. Items 1 (test fired bullets), 2, 3, and 5 were microscopically examined and compared. Agreement of class characteristics was observed. However, there is insufficient agreement or disagreement of individual characteristics to either identify or eliminate the bullets as having been fired from the same firearm. Item 4 was microscopically examined and compared to Items 1 (test fired bullets) 2, 3, and 5. Based on observed disagreement of individual characteristics and some apparent class characteristics, Item 4 was eliminated as having been fired from the same firearm(s) as Items 1, 2, 3, and 5.
T7JJXH	Items 2, 3, 4 and 5 were not fired from the firearm (Item 1). Items 2,3 and 5 were fired from the same firearm. Item 4 was not fired by the firearm that fired Items 2,3 and 5.
T7NYBH	A) The spent projectiles mentioned in Item 1-2, Item 1-3, and Item 1-5 were all fired from the same unknown weapon capable of chambering and firing .40 caliber class ammunition with a rifling system consisting of six (6) lands and grooves with a right twist. "Identification" B) The spent projectiles mentioned in Item 1-2, Item 1-3, and Item 1-5 were not fired from the suspect's weapon that produced Item 1-1 (Three (3) test fires). "Exclusion" C) The spent projectile mentioned in Item 1-4 was fired from an unknown weapon capable of chambering and firing .40 caliber class ammunition excluding the suspect's weapon which produced Item 1-1 (test fires) and the unknown weapon that fired Item 1-2, Item 1-3, and Item 1-5 (spent projectiles). "Exclusion"
TA48YH	The Exhibit 2, 3, and 5 bullets could not be identified or excluded as having been fired from the same firearm or from the same firearm that fired the Exhibit 1 bullets based on an agreement of class characteristics and insufficient agreement or disagreement of individual characteristics. The result of the comparison was inconclusive. (Inconclusive) The Exhibit 4 bullet was excluded as having been fired from the same firearm that fired the Exhibit 1 bullets or the same firearm(s) that fired the Exhibit 2, 3, and 5 bullets. (Source exclusion)
TDN3EV	[No Conclusions Reported.]
TE3LL8	The Item 1 – 5 bullets were microscopically examined and compared. The Item 2, 3, and 5, caliber 40 S&W/10mm Auto, bullets were identified as having been fired from the same firearm based on corresponding class and individual characteristics. The Item 2, 3, and 5 bullets exhibit the same general rifling class characteristics as those produced by the firearm that reportedly fired the Item 1 test fired bullets; however, the result of the microscopic comparison was inconclusive due to the lack of sufficient suitable corresponding microscopic markings. It was not possible to identify or eliminate the Item 2, 3, and 5 bullets as having been fired from the firearm that reportedly fired the Item 1 test fired bullets. The Item 4, caliber 40 S&W/10mm Auto, bullet was fired from a firearm having a polygonal rifled barrel and exhibits limited microscopic markings that may be suitable for identification with the firearm from which it was fired. Item 4 was eliminated as having been fired from the firearm that reportedly fired the Item 1 test fired bullets and the firearm that fired Items 2, 3, and 5 due to differences in class characteristics. Firearms that produce general rifling class characteristics like those present on Item 4 include firearms chambered to fire caliber 40 S&W/10mm Auto cartridges with the brand names listed below. Glock 10mm Auto/40 S&W Heckler & Koch 40 S&W This list is not all-encompassing. It is possible another brand of firearm produced these class characteristics and is not listed due to the content of the databases searched.

TABLE 2

WebCode	Conclusions
TJTVV7	Examinations to determine if Items 2, 3, and 5 were discharged from the same firearm as the known test-fired bullets were inconclusive. Examinations showed the bullet listed as Item 4 was not discharged from the same firearm as the known test-fired bullets.
TK7P8Y	The fired projectiles, Item 2, Item 3 and Item 5, could not be identified or eliminated as having been fired in the same firearm as the test fired projectiles, within Item 1, based on agreement of class characteristics but insufficient individual characteristics in a pattern. The fired projectiles, Item 2, Item 3 and Item 5, were identified as having been fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics within the land impressions. The fired projectile, Item 4, was eliminated as having been fired in the same firearm as the fired projectiles, Item 2, Item 3 and Item 5, and the test fired projectiles, within Item 1, based on disagreement of class characteristics.
TKNFH6	Through microscopic examination and comparison, the following was determined: Items 2, 3 and 5 could not be identified or eliminated as having been fired by the same firearm that fired Item 1 or as having been fired from a single firearm. Item 4 was not fired by the firearm(s) that fired Items 1, 2, 3 or 5.
TMCWQR	There are two individual characteristics that can be found in four (4) questioned bullets. This means there are two firearms used by a suspect during the incident. Questioned bullet from Item No. 2, Item No.3, and Item No.5 having the same individual characteristics with Item No.1 (test-fired) bullets discharged from the suspect's firearm).
TPFRCF	The problem bullets identified as 2, 3 and 5 present correspondence in their individual characteristics when compared to the control bullets identified as 1.
TQTEUU	There is some limited agreement of individual characteristic markings within the test fired bullets in Item 1. There is poor reproducibility of the individual characteristic markings across all three test-fired bullets. The class characteristics of the test-fired bullets are in agreement with the bullets in Items 2, 3 and 5. However due to a lack of reproducibility of individual characteristic markings it is inconclusive as to whether Items 2,3 and 5 were fired from the same gun as the test-fired bullets in Item 1. The class characteristics of the test-fired bullets in Item 1 are in disagreement with the bullet in Item 4. The bullet in Item 4 was not fired from the same gun as the test-fired bullets in Item 1.
TYNGV7	Since the markings are very poor, no definite conclusion is possible.
UEAACW	Item 002 and Item 003 were microscopically compared to each other. Item 002 and Item 003 could neither be identified nor eliminated as having been fired from the same firearm barrel due to the correspondence of all discernible class characteristics and some agreement of individual characteristics, but insufficient for an identification. Item 002 and Item 003 were microscopically compared to Item 005. Item 002 and Item 003 could neither be identified nor eliminated as having been fired from the same firearm barrel as Item 005 due to insufficient agreement/disagreement of individual characteristics; however, similar class characteristics were observed. Item 002, Item 003, and Item 005 were microscopically compared to Item 001. Item 002, Item 003, and Item 005 could neither be identified nor eliminated as having been fired from the same firearm barrel as Item 001 due to insufficient agreement/disagreement of individual characteristics; however similar class characteristics were observed. Item 002, Item 003, and Item 005 are 40 caliber-class copper jacketed bullets fired from a firearm(s) with a conventional rifling pattern of six lands and grooves with a right twist. The class characteristics of Item 002, Item 003, and Item 005 were searched through a General Rifling Characteristics (GRC) database to generate a list of firearms that could have

TABLE 2

WebCode	Conclusions
	fired Item 002, Item 003, and Item 005. In addition to the firearm that fired Item 001, firearms that could have fired Item 002, Item 003, and Item 005, include, but are not limited to, the following: 40 S&W caliber Beretta, Ceska Zbrojovka, Czechoslovakia, Iberia Arms, Sigarms, Smith & Wesson, Steyr-Mannlicher, and Taurus semi-automatic pistols. Item 004 was microscopically compared to Item 001, Item 002, Item 003, and Item 005. Item 004 was eliminated as having been fired from the same firearm barrel(s) as Item 001, Item 002, Item 003 and Item 005 due to the disagreement of discernible class characteristics. Item 004 is a 40 caliber-class copper jacketed bullet fired from a firearm with a polygonal rifling pattern of six lands and grooves with a right twist. The class characteristics of Item 004 were searched through a General Rifling Characteristics (GRC) database to generate a list of firearms that could have fired Item 004. Among the more common firearms that could have fired Item 004, include, but are not limited to, the following: 10mm Auto caliber Glock semi-automatic pistols or 40 S&W caliber Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, Tanfoglio and Walther semi-automatic pistols. These lists are not meant to be all-inclusive, but rather investigative aids. Any suspect firearm(s) of the appropriate caliber-class should be submitted for comparison. Complete lists of the search results will be maintained in the case record.
UG2J8J	Exhibits 2, 3, and 5 were identified as having been fired from the same firearm. Exhibits 2, 3, and 5 could not be identified or excluded as having been fired from the same firearm as the Exhibits 1A through 1C purported test fires due to agreement of class characteristics and insufficient agreement or disagreement of individual characteristics. The result of the comparison was inconclusive. Exhibit 4 was excluded as having been fired from the same firearm as the Exhibits 1A through 1C purported test fires or the same firearm as Exhibits 2, 3, and 5.
UGMWVW	In my opinion it was not possible to determine with certainty if the recovered gun (bullets, item 1) had been fired at the crime scene. Whilst in my opinion it had not fired bullet item 4, it was not possible to determine whether or not it had fired bullet items 2, 3 or 5.
UHUADY	Based on microscopic comparisons, in the opinion of the laboratory: Items 2-2-1 (CTS Item 2), 2-3-1 (CTS Item 3), and 2-5-1 (CTS Item 5) bullets could not be identified or eliminated as having been fired by the same firearm that fired item 2-1-1 (CTS Item 1) bullets. These inconclusive conclusions were due to insufficient similarities and insufficient differences observed in the patterns of microscopic markings for conclusions of identification or elimination, respectively. Class Characteristic Elimination: Based on differences in class characteristics, item 2-4-1 (CTS item 4) bullet was eliminated as having been fired by the same firearm that fired item 2-1-1 (CTS Item 1) bullets.
UKM63T	The bullet collected at the crime scene corresponding to ITEM 4 was not fired by the CZ 75 P-07 firearm seized from the suspect. It is not possible to determine whether the bullets collected at the scene corresponding to ITEM 2, ITEM 3 and ITEM5 were fired by the CZ 75 P-07 firearm seized from the suspect.
ULD87V	Items 1, 2, 3, and 5 are six 40/10mm caliber fired bullets exhibiting conventional style rifling characteristics consisting of six land and groove impressions with a right twist. Item 4 is a 40/10mm caliber fired bullet exhibiting polygonal style rifling characteristics consisting of six land and groove impressions with a right twist. Based on the agreement of caliber and rifling characteristics, items 2, 3, and 5 fired bullets were microscopically compared to test fired bullets from the suspect's firearm, item 1. All three bullets were eliminated as having been fired by the firearm represented by item 1 based on the sufficient disagreement of class and individual characteristics. Based on the agreement of class characteristics, items 2, 3, and 5 fired bullets were microscopically compared to each other. All three bullets were identified as

TABLE 2

WebCode	Conclusions
	having been fired by the same unknown firearm based on the sufficient agreement of individual characteristics. Firearms with the same general rifling characteristics as items 2, 3, and 5 include, but are not limited to, Beretta, CZ, FN, Iberia Arms, SigArms, Smith & Wesson, Springfield, and Taurus. Based on the disagreement of class characteristics, item 4 fired bullet was eliminated as having been fired by the firearms represented by item 1 and items 2, 3, and 5. An identification conclusion is made when there is agreement of all discernible class characteristics and sufficient agreement of a combination of individual characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool. An elimination conclusion is made when there is significant disagreement of discernible class characteristics and/or individual characteristics.
ULGQVJ	Item 1.1 consists of three 40 caliber bullets which were reportedly fired through a CZ brand 40 S&W, model 75 P-07 pistol. Items 1.2, 1.3 and 1.5 are three 40 caliber bullets with six land and groove impressions with a right twist. Item 1.4 is a 40 caliber bullet with six polygonal land and groove impressions with a right twist. Items 1.2, 1.3, 1.4 and 1.5 were microscopically compared to each other and the bullets from Item 1.1 with the following results: Based an agreement of all discernible class characteristics without agreement or disagreement of individual detail due to a lack of reproducibility and insufficiency of detail, Items 1.2, 1.3 and 1.5 can neither be identified nor eliminated as having been fired by the same firearm(s) or the firearm used to test fire Item 1.1. Based on disagreement of all discernible class characteristics, Item 1.4 was eliminated as having been fired by the firearm used to test fire Item 1.1 or the firearm(s) that fired Items 1.2, 1.3 and 1.5.
UNMCL6	Microscopic examination and comparison revealed that Items 2, 3, and 5 could neither be identified nor eliminated as having been fired from the same firearm as the test fires reportedly from Item 1 due to insufficient agreement / disagreement of individual characteristics; however, similar class characteristics were noted. Items 2, 3, and 5 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 4 was microscopically eliminated as having been fired from the same unknown firearm as Items 2, 3, and 5, and the same firearm as the test fires reportedly from Item 1 due to disagreement of discernible class characteristics.
UNPWGK	Comparison microscope examinations were conducted on the evidence listed above. The findings of this examiner are the following: 1. Exhibits 1.1, 1.2 and 1.4 were fired in one firearm based on sufficient agreement of individual characteristics observed. 2. The test fires submitted in Exhibit 1 were found to have been produced by a second firearm based on differences of class characteristics with Exhibit 1.3 and differences of individual characteristics with Exhibits 1.1, 1.2 and 1.4. 3. Exhibit 1.3 was fired in a 3rd firearm based on differences in class characteristics. 4. The following is an investigative lead only and not intended to exclude all other makes of firearms. Based on class characteristics of Exhibit 1.3, the possible firearms include 9mm caliber Glock and Heckler and Koch pistols. 5. The following is an investigative lead only and not intended to exclude all other makes of firearms. Based on class characteristics of Exhibits 1.1, 1.2 and 1.4, the possible firearms include 9mm caliber CZ pistols. No further analysis was conducted on the submitted evidence at this time.
UQATWX	The CZ pistol, specimen #1, was test fired using material from the laboratory collection and was found to be operable. The reference fired projectiles obtained were compared to the unknown caliber copper jacketed projectiles, specimens #2 through #5. The following was determined: > Specimens #2, #3 and #5 were consistent with .40 caliber class ammunition

TABLE 2

WebCode	Conclusions
	(which includes .40 S&W). Further examination revealed that specimens #2, #3 and #5 possessed the same class characteristics as well as sufficient agreement of individual markings to one another and to the test fired material from specimen #1 to determine specimens #2, #3 and #5 were fired from specimen #1. > Specimen #4 was consistent with .40 caliber class ammunition (which includes .40 S&W). Further examination revealed that specimen #4 possessed different rifling characteristics from specimens #1, #2, #3 and #5 and was fired from a different weapon.
UUMVJU	1. The submitted item 2, item 3 and item 5 were microscopically examined and compared to each other; they were positively identified as having been fired in same firearm. 2. The submitted item 2 was microscopically examined and compared to test fires recovered from the submitted item 1; it was eliminated as having been fired in the same firearm. 3. The submitted item 2 and item 4 were microscopically examined and compared to each other; it was eliminated as having been fired in the same firearm. 4. The submitted item 4 was microscopically examined and compared to test fires recovered from the submitted item 1; it was eliminated as having been fired in the same firearm.
UV6HHC	The Items 1, 2, 3 and 5 fired bullets were examined and each determined to be a 40/10mm caliber bullet that was fired from a barrel having conventional style rifling consisting of six lands and grooves with right twist. The Item 4 fired bullet was examined and determined to be a 40/10mm caliber bullet that was fired from a barrel having polygonal style rifling consisting of six lands and grooves with right twist. Microscopic results: The Items 1, 2, 3 and 5 fired bullets were microscopically compared to each other based on agreement of class characteristics. The following was determined: The Items 2, 3 and 5 fired bullets were identified as having been fired by the same unknown firearm due to sufficient agreement of individual characteristics. Firearms rifled with similar class characteristics are too numerous to list. Any 40/10mm caliber firearms recovered during the course of this investigation should be submitted, along with these items for comparison purposes. The Items 2, 3 and 5 fired bullets were eliminated as being fired by the firearm that fired Item 1 due to agreement of class characteristics but sufficient disagreement of individual characteristics. The Item 4 fired bullet was eliminated as having been fired by the same firearms as the Items 1, 2, 3 and 5 fired bullets due to differences in class characteristics. Common firearms with the same (or that produce the same) class characteristics as the Item 4 fired bullet include models produced by: Bersa, Glock, Heckler & Koch, Israel Military Industries (IMI), Kahr Arms and Vektor. This is not an all-inclusive list; therefore, all 40/10mm caliber firearms recovered during the course of this investigation should be submitted along with the above listed fired evidence. The significance of these identifications is made to the practical, not absolute, exclusion of all other firearms.
VERQTC	1) Examination of Exhibit 1 revealed three PMC brand full metal copper jacketed .40 S&W caliber bullets test-fired through a suspect's CZ P07 pistol. 2) Exhibits 2 through 5 each contain one fired bullet with the following physical features: .40 caliber, full metal jacketed, copper jacket material, six lands and grooves with a right-hand twist. 3) Exhibits 1 through 5 were microscopically compared: a. Exhibits 2, 3, and 5 were fired from the same firearm due to an agreement of class characteristics and individual characteristics. b. Exhibits 2, 3, and 5 were not fired from the same firearm as Exhibit 1 due to an agreement of class characteristics and disagreement of individual characteristics. c. Exhibit 4 was not fired from the same firearm as Exhibit 1 nor Exhibits 2, 3, and 5 due to a disagreement of class characteristics.
VFJP7A	The fired bullets, items #2, 3, 4, 5, were microscopically eliminated from having been fired in the known firearm that test fired item #1. The fired bullets, items #2, 3, 5, were microscopically identified as having been fired in the same unknown firearm. The fired bullet,

TABLE 2

WebCode	Conclusions
	item #4, was fired by a second unknown firearm. Item #4 can be eliminated from items #1, 2, 3, 5, due to differences in class characteristics.
VHBNK9	Microscopic Comparison Conclusions: Identification: Based upon the reproducibility of class characteristics and microscopic individual characteristics, the following identifications were made: Lab Item #: Evidence: Type: Conclusion: 2, 3 & 5 (3) fired projectiles. Fired thru the same firearm barrel. Elimination: Based upon the difference in class characteristics, the following eliminations were made: Lab Item #: Evidence: Type: Conclusion: 4 (1) fired projectile. Not fired thru the same barrel as Items 1, 2, 3 or 5. Based upon the difference in individual characteristics, the following eliminations were made: Lab Item #: Evidence: Type: Conclusion: 2, 3 & 5 (3) fired projectiles Not fired thru the barrel of Item 1. [Participant submitted data in a format that could not be reproduced in this report].
VHTPCG	The fired bullets, Items 2, 3, and 5, were identified as having been fired from one firearm, but not from the firearm that fired the bullets, Items 1A, 1B, and 1C. Items 2, 3, and 5 are most consistent with bullets commonly loaded in 40 S&W caliber cartridges. Manufacturers of firearms known to exhibit general rifling characteristics similar to these bullets include, but are not limited to, the following: Beretta, Ceska Zbrojovka, Heritage, Iberia Arms, KSN Industries, SigArms, Smith & Wesson, Steyr, Steyr-Mannlicher, and Taurus. The fired bullet, Item 4, was fired from a third firearm. This item is most consistent with bullets commonly loaded in 40 S&W and 10mm Auto caliber cartridges. Manufacturers of firearms known to exhibit general rifling characteristics similar to this bullet include, but are not limited to, the following: 40 S&W - Bersa, Glock, Hecker & Koch, IMI, Kahr Arms, and Vektor 10mm Auto - Glock.
VPB8KH	Exhibit 1 consists of three (3) test fired, nominal 40 caliber bullets, reportedly from a “CZ 75 P-07 firearm”. Exhibits 2 through 5 each consist of one (1) fired, nominal 40 caliber, full metal jacketed bullet. The Exhibit 2, 3, and 5 bullets were identified as having been fired from the same firearm. (Source identification) The Exhibit 1A through 1C bullets could not be identified or excluded as having been fired from the same firearm, based on an agreement of class characteristics and a lack of sufficient agreement or disagreement of individual characteristics. (Inconclusive) The Exhibit 2, 3, and 5 bullets could not be identified or excluded as having been fired from the same firearm as Exhibits 1A through 1C, based on an agreement of class characteristics and a lack of sufficient agreement or disagreement of individual characteristics. (Inconclusive) The Exhibit 4 bullet was excluded as having been fired from the same firearm(s) as Exhibits 1, 2, 3, and 5. (Source exclusion) Firearms that produce general rifling characteristics like those present on Exhibits 2, 3, and 5 include, but are not limited to, the following: - 40 Smith & Wesson caliber Beretta, Ceska Zbrojovka, Heritage, Iberia Arms, Republic Arms, Sigarms, Smith & Wesson, Steyr, and Taurus pistols Firearms that produce general rifling characteristics like those present on Exhibit 4 include, but are not limited to, the following: - 10mm Auto caliber Glock pistols - 40 Smith & Wesson caliber Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor pistols
VPBXZD	Bullet Analysis: Methodology: Physical (Visual Examination). Electronic Balance/Digital Caliper/Digital Micrometer. Microscopy (Comparison Microscope). Items 1, 2, 3, 4, and 5 are 40 caliber class bullets based upon the diameter. Items 2, 3, and 5, the bullets, were fired through the barrel of the same firearm based upon corresponding class and individual microscopic characteristics. Item 4, the bullet, was not fired through the barrel of the same firearm as Items 1, 2, 3, and 5, the bullets, based upon different class characteristics. Comparisons between Items 2, 3, and 5, the bullets, to Item 1, the bullet, was inconclusive due to insufficient individual microscopic characteristics. Opinion/Interpretation: Items 1, 2, 3, 4, and 5 are consistent with bullets loaded in .40 S&W and 10mm Auto caliber cartridges based

TABLE 2

WebCode	Conclusions
	upon the weight and style.
VVYUD3	Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Laboratory Item 1, were identified as having been fired from the same firearm. Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired bullets, Laboratory Items 2, 3, and 5, were identified as having been fired from the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of individual characteristics, the fired bullets, Laboratory Item 1, could not have been fired from the same firearm as the fired bullets, Laboratory Items 2, 3, and 5. Through macroscopic/microscopic examination and based on significant disagreement of class characteristics, the fired bullet, Laboratory Item 4, could not have been fired from the same firearm as the fired bullets, Laboratory Item 1, or from the same firearm as the fired bullets, Laboratory Items 2, 3, and 5.
WCG98K	1. The bullet marked E-1 to E-3, corresponding to Item 1, are .40/10mm caliber, with rifling to the right (R-6) and were fired by the same firearm (Identification). [Initials] November/09/2023 2. The bullet marked E-4 to E-6, corresponding to Item 2, Item 3 and Item 5, are .40/10mm caliber, with rifling to the right (R-6) and were fired by the same firearm (Identification). [Initials] November/09/2023 3. The bullet marked E-7, corresponding to Item 4, is .40/10mm caliber, with right-hand rifling (R-6) and was fired from a firearm. [Initials] November/09/2023
WD8HVT	1. It is established that the three projectiles identified as ITEM 2, 3, and 5, exhibit the same class and identity characteristics as the three projectiles identified as ITEM 1, Consequently, it is concluded that they correspond to a .40 caliber and were fired by a first firearm. 2. It is established that the projectile identified as ITEM 4, presents different identity characteristics from the projectiles detailed in paragraph 1 of these conclusions. Therefore, it is concluded that it corresponds to a .40 caliber and was fired by a second firearm.
WE8ABN	Examined the three specimens marked #2, #3, and #5. They weigh 179.90, 179.76, and 180.02 grains, respectively, and each indicates six lands and six grooves with a right hand twist. They are 40 caliber class discharged full metal jacketed bullets. Examined the specimen marked #4. It weighs 179.98 grains and indicates six lands and six grooves (polygonal rifling) with a right hand twist. It is a 40 caliber class discharged full metal jacketed bullet. The three bullets marked #2, #3, and #5 were microscopically compared to each other and identified as having been discharged from the same firearm. The bullet marked #4 was microscopically compared to the three bullets marked #2, #3, and #5 and eliminated as having been discharged from the same firearm. The bullet marked #4 was microscopically compared to the bullet test standards marked #1 and eliminated as having been discharged from the same firearm. The three bullets marked #2, #3, and #5 were microscopically compared to the bullet test standards marked #1; however, the results of the comparison were inconclusive.
WKPRJP	The comparisons of the questioned bullets (Items 2, 3 and 5) with the test-fired bullets (Items 1A, 1B and 1C) were inconclusive. Item 4 was not fired in the same barrel as the test-fired bullets (Items 1A, 1B and 1C).
WNCJGD	Exhibit 1 consists of three (3) reported test fired bullets from a CZ, model P-07 pistol. The Exhibit 1, 2, 3, and 5 bullets could not be identified or excluded as having been fired from the same firearm based on an agreement of class characteristics and neither sufficient agreement nor sufficient disagreement of individual characteristics. (Inconclusive) The Exhibit 4 bullet was excluded as having been fired from the same firearm(s) that fired the Exhibit 1, 2, 3, and 5 bullets. (Source exclusion) Firearms that produce general rifling characteristics similar to those

TABLE 2

WebCode	Conclusions
	observed on Exhibits 2, 3, and 5 include numerous makes and models. Firearms that produce general rifling characteristics similar to those observed on Exhibit 4 include, but may not be limited to, 40 S&W and 10mm caliber pistols marketed by Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, and Vektor.
WP4F78	Items 2-5 have not been fired from the suspected firearm. Items 2, 3 and 5 have been shot with the same firearm.
WP7XCH	Items 1A, 1B and 1C were three .40 Smith & Wesson caliber copper jacketed bullets that were fired through a barrel with conventional right twist rifling of six lands and grooves. Items 2, 3, and 5 were all nominal .40/10mm caliber copper jacketed bullets that had been fired through a barrel(s) with conventional right twist rifling of six lands and grooves. The weight and design of Items 2, 3, and 5 was consistent with bullets commonly loaded in .40 Smith & Wesson cartridges. Item 4 was a nominal .40/10mm caliber copper jacketed bullet that had been fired through a barrel with polygonal right twist rifling of six lands and grooves. The weight and design of Item 4 was consistent with bullets commonly loaded in .40 Smith & Wesson cartridges. Item 4 was compared to Items 1A, 1B, and 1C using a comparison microscope. Differences in class characteristics (polygonal vs conventional rifling) were observed. Item 4 was not fired by the CZ pistol. Items 2, 3, and 5 were intercompared using a comparison microscope. Agreement of class and individual characteristics sufficient for an identification was observed. Items 2, 3, and 5 were fired in a single firearm. Items 2 was compared to Items 1A, 1B, and 1C using a comparison microscope. Agreement of class characteristics and some agreement of individual characteristics was observed; however, the individual detail was insufficient to determine if Item 2 was fired by the CZ pistol (inconclusive). The examination was limited by the poor reproducibility of the test-fires. Item 3 was compared to Items 1A, 1B, and 1C using a comparison microscope. Although all class characteristics agreed, there was no significant agreement or disagreement of individual characteristics observed. Therefore, it was unable to be determined if Item 3 was or was not fired by the CZ pistol (inconclusive). The examination was limited by the poor reproducibility of the test-fires. Item 5 was compared to Items 1A, 1B, and 1C using a comparison microscope. Although all class characteristics agreed, there was no significant agreement or disagreement of individual characteristics observed. Therefore, it was unable to be determined if Item 5 was or was not fired by the CZ pistol (inconclusive). The examination was limited by the poor reproducibility of the test-fires. Item 4 was compared to Items 2, 3, and 5 using a comparison microscope. Differences in class characteristics (polygonal vs conventional rifling) were observed. Item 4 was not fired by the same firearm as Items 2, 3, or 5.
WQWFXQ	K1 (Item #001) – Three (3) test fired bullet standards of a CZ 75 P-07; .40 caliber handgun. Q1 (Item #002) – One (1) bullet. Q2 (Item #003) – One (1) bullet. Q3 (Item #004) – One (1) bullet. Q4 (Item #005) – One (1) bullet. The Q1, Q2, and Q4 were microscopically compared and determined to have consistent class characteristics and sufficient agreement of individual characteristics to render an identification. Therefore, the Q1, Q2, and Q4 were all fired through the same barrel. The Q2 and the Q3 were microscopically compared and determined to have significant disagreement of class characteristics to render an elimination. Therefore, the Q3 was not fired through the same barrel as the Q1, Q2, and Q4. The Q2 was microscopically compared to the laboratory test fired bullets of the K1 (CZ) handgun and determined to have consistent class characteristics and sufficient agreement of individual characteristics to render an identification. Therefore, the Q1, Q2, and Q4 were all fired through the barrel of the K1 handgun.
WRBVDD	The Exhibit 1 bullets were labeled as "Test Fires" from a "CZ model 75 P-07, 40 S&W" firearm.

TABLE 2

WebCode	Conclusions
	The Exhibit 2, 3, and 5 bullets could not be identified or excluded as having been fired from the same firearm that fired Item 1. The result of the comparison was inconclusive. The Exhibit 2, 3, and 5 bullets were identified as having been fired from the same firearm. Firearms that produce general rifling characteristics similar to those observed on Exhibits 2, 3, and 5 include, but may not be limited to, 40S&W pistols marketed by Beretta, Ceska Zbrojovka, Iberia Arms, Sigarms, Smith and Wesson, Stery, Taurus, and 400 Cor-Bon pistols marketed by AMT. The Exhibit 4 bullet was excluded as having been fired from the same firearm(s) as Exhibits 1, 2, 3 and 5. Firearms that produce general rifling characteristics similar to those observed on Exhibit 4 include, but may not be limited to, 40S&W pistols marketed by Bersa, Glock, Heckler & Koch, IMI, Kahr Arms, Vektor, and 10mm auto pistols marketed by Glock.
WT3Q38	By means of microscopic comparison, the bullets (item 1 and items 2, 3 and 5 were identified as having been fired from the same firearm. This qualitative identification is based on the agreement of all discernible class and sufficient agreement of individual characteristics. Using comparison microscopy, a difference in class characteristics was observed. Therefore, the bullet (item 4) could not have been fired from the same firearm as the bullets (item 1).
X9VLCC	On October 23, 2023, [Name] of the [Laboratory] Quality Assurance Section delivered the following to this section for examination: 1-1: Test Fire Three known test-fired bullets discharged from the suspect's firearm. 1-2: Spent Projectile(s). Questioned recovered bullet. 1-3: Spent Projectile(s). Questioned recovered bullet. 1-4: Spent Projectile(s). Questioned recovered bullet. 1-5: Spent Projectile(s). Questioned recovered bullet. Compared item 1-1 test fires to items 1-2 through 1-5, as well as items 1-2 through 1-5 to each other. After physical and microscopic examination of the items listed above, it is my opinion that: A) The discharged cartridge casings mentioned in items 1-2, 1-3, and 1-5 above were fired from the same unknown weapon capable of firing .40 caliber ammunition. Identification. B) The projectile mentioned in item 1-4 above was not fired from the weapon that produced item 1-1 or weapon that produced items 1-2, 1-3, or 1-5, due to a disagreement of class characteristics (rifling). Item 1-4 was fired from an unknown weapon capable of firing .40 caliber ammunition. Exclusion. C) The projectiles mentioned in items 1-2, 1-3, and 1-5 were not fired from the weapon that produced item 1-1 test fires, due to a disagreement of individual markings. Exclusion
XAR2MN	It was not possible to determine whether the bullets recovered as Item 2, Item 3, and Item 5 were fired with the suspect's firearm (Item 1) or by another weapon that prints similar class marks. The bullet recovered as item 4, was not fired with the suspect's firearm (Item 1).
XBMU7E	The three (3) test fired bullets received with item 1 were intra-compared and determined to have an agreement of class characteristics but could neither be identified nor eliminated as having been fired from the same firearm due to an insufficient agreement or disagreement of individual characteristics. All such comparisons were inconclusive. Items 2, 3, and 5 were identified as having been fired from the same unknown firearm based on the significant agreement of class and individual characteristics. Items 2, 3, and 5 were determined to have class characteristics consistent with the test fired bullets received with item 1 but could neither be identified nor eliminated as having been fired from the same firearm(s) as that which fired the test fired bullets received with item 1 due to an insufficient agreement or disagreement of individual characteristics. All such comparisons were inconclusive. Item 4 was eliminated as having been fired from the same firearm(s) as that which fired items 2, 3, 5, and the test fired bullets received with item 1 based on the significant disagreement of class characteristics.
XE43UD	The test-fired bullets, Item 1, were compared to the recovered bullets, Items 2-5, using a comparison microscope. Based on the examination, it is my opinion that the results for Items 2,

TABLE 2

WebCode	Conclusions
	3, and 5 were inconclusive. This was due to an agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Based on the examination of the test-fired bullets, Item 1, and the recovered bullet, Item 4, it is my opinion that there was disagreement of class characteristics and therefore, Item 4 was fired in a different firearm.
XMVMPD	1-1: Test Fires: Three (3) (A,B,C,) spent projectiles from seized weapon (.40 caliber, CZ 75 P-10) (Known). 1-2: One (1) spent projectile. (Questioned). 1-3: One (1) spent projectile. (Questioned). 1-4: One (1) spent projectile. (Questioned). 1-5: One (1) spent projectile. (Questioned). Compared the test fires of the seized CZ pistol (Items 1-1 A,B,C) to Items 1-2 through 1-5. After physical and microscopic examination of the submitted evidence, against test fired specimens, it is my opinion that: A) The spent projectiles mentioned above as Items 1-2, 1-3, 1-5 were fired by the same unknown weapon/barrel capable of firing .40 caliber class ammunition. Although they share the same class characteristics as seized weapon test fires (Item 1-1), there is disagreement of individual markings on the land and groove impressions and were not fired by seized weapon. “Identification and Exclusion” B) The spent projectile mentioned above as Item 1-4 was fired by an unknown weapon/barrel capable of firing .40 caliber class ammunition not fired by seized CZ or unknown weapon that fired Items 1-2, 1-3, 1-5 due to a disagreement of class characteristics (Polygonal vs. cut rifling). “Exclusion”
XTNHXD	Exhibit bullets 2, 3 and 5 INCONCLUSIVE to test fired bullets 1; Exhibit bullet 4 ELIMINATED; Exhibit bullets 3 and 5 IDENTIFIED
XUWQTQ	1. The items 2, 3, 4, and 5 fired bullets were examined and determined to be consistent with 40 caliber class (40 S&W, 10mm Auto). 2. The item 4 fired bullet was eliminated as having been fired from the same firearm as the items 2, 3, and 5 fired bullets. 3. The items 2 and 3 fired bullets were identified as having been fired from the same firearm. 4. There is agreement of all discernible class characteristics between the item 5 fired bullet and items 2 and 3 fired bullets, however; the comparison of individual characteristics was inconclusive. Therefore, the item 5 fired bullet could not be identified or eliminated as having been fired from the same firearm as the items 2 and 3 fired bullets. 5. The item 4 fired bullet was eliminated as having been fired from the same firearm as the item 1 test fires. 6. There is agreement of all discernible class characteristics between the item 1 test fired bullets and the items 2, 3, and 5 fired bullets, however; the comparison of individual characteristics was inconclusive. Therefore, the items 2, 3, and 5 fired bullets could not be identified or eliminated as having been fired from the same firearm as the item 1 test fires. 7. The general rifling characteristics of the item 4 fired bullet determined firearms with similar rifling characteristics that could have fired this bullet include, but are not limited to: Glock, Bersa, Heckler & Koch, IMI, KahrArms, Vektor, and possible others unknown to the examiner, to include privately made firearms and aftermarket barrels. 8. The general rifling characteristics of the items 2, 3, and 5 fired bullets determine firearms with similar rifling characteristics that could have fired this bullet include, but are not limited to: Beretta, Ceska Zbrojovka, Czechoslovakia, Heritage, Iberia Arms, KSN Industries, Republic Arms, Sig Arms, Smith & Wesson, Steyr, Taurus, and possible others unknown to the examiner, to include privately made firearms and aftermarket barrels.
XWKBM2	EVIDENCE SUBMITTED: Lab Item #: Agency Item #: Description: 1: F2: One (1) cardboard box containing: 1.1: F2: Three (3) testfires from one (1) CZ model 75 P-07, .40 S&W caliber pistol. 1.2: F2: One (1) fired bullet. 1.3: F2: One (1) fired bullet. 1.4: F2: One (1) fired bullet. 1.5: F2: One (1) fired bullet. CONCLUSIONS OF ANALYSIS: The fired bullet, item 1.4, was eliminated as having been fired in the CZ pistol, item 1.1, based on a difference in class

TABLE 2

WebCode	Conclusions
	characteristics (rifling (polygonal vs conventional)). The three (3) fired bullets, items 1.2, 1.3, and 1.5, were consistent in all observable class characteristics (caliber, number of lands and grooves, rifling, twist, and widths of lands and grooves) as the CZ pistol, item 1.1. However, due to a lack of reproducible individual microscopic markings, the fired bullets could neither be eliminated nor identified as having been fired in the CZ pistol. The results are inconclusive. The three (3) fired bullets, items 1.2, 1.3, and 1.5, were consistent in all observable class characteristics (caliber, number of lands and grooves, rifling, twist, and widths of lands and grooves). However, due to a lack of reproducible individual microscopic markings, the fired bullets could neither be eliminated nor identified as having been fired in the same unknown firearm. The results are inconclusive.
XXDBDK	The 001-01 test fired bullets were examined and microscopically compared with the 001-02 through 001-05 fired bullets with the following results: The 001-02, 001-03 and 001-05 fired bullets were inconclusive as to having been fired through the barrel of the same firearm as the 001-01 test fired bullets. Inconclusive is based on insufficient agreement or disagreement of individual characteristics within the land and groove impressions. The 001-04 fired bullet was eliminated as having been fired through the barrel of the same firearm as the 001-01 test fired bullets.
XY683E	Due to the characteristics presented by the bullets of items 2,3 and 5 and compared with the standard samples, it is determined that they present common identity characteristics among themselves, that is, they were fired by the same firearm. The bullet listed item 4 by class characteristics did not need to be compared with the standard samples
XZ4BZW	The items 2, 3, and 5 fired bullets can neither be identified nor eliminated from having been fired from the firearm that fired the test fired bullets listed as item 1 (1A, AB and 1C) due to a lack of / insufficiency in individual characteristics. The item 4 fired bullet is eliminated from having been fired in the firearm that fired the test fired bullets listed as item 1 (1A, 1B and 1C) based on a difference in class characteristics. The items 2, 3, and 5 bullets are identified as being fired in the same firearm.
Y2CTKD	The submitted bullets (Items 2,3,4,5) were examined and microscopically compared to the test fired bullets (Item 1). It was determined that the fired bullet in Item 4 was not fired in the same firearm as the test fired bullets (Item 1). The bullets in Items 2, 3, and 5 were compared to the test fired bullets in Item 1. There was agreement of all discernable class characteristics without agreement or disagreement of Individual characteristics due to the limited number of quality striations on the test fired bullets in Item 1. Therefore, It's inconclusive as to whether or not Items 2, 3, and 5 were fired in the same firearm as the test fired bullets in Item 1. The bullets in Items 3 and 5 were fired in the same unknown firearm capable of chambering and firing .40/10mm caliber ammunition. The bullet in Item 2 was compared to the bullets in Items 3 and 5. There is agreement of all discernable class characteristics without agreement or disagreement of individual characteristics due to limited number of quality striations on the land impressions in Item 2. Therefore, It's inconclusive as to whether or not Item 2 was fired in the same firearm as the bullets in Items 3 and 5. The association made in this examination is based on the observation of agreement of all discernable class characteristics and sufficient agreement of individual tool mark characteristics.
Y33A6L	Ex's. 2, 3, & 5 were identified as having been fired from the Ex.1 firearm. Ex. 4 was eliminated from having been fired from the Ex. 1 firearm.
Y8JBTE	Item #1: Three (3) 40 / 10mm caliber, FMJ, fired bullet specimens with 06R consistent with conventional LAGs. Stated source: Test fire samples from a CZ75, P-07, caliber 40 S&W, no

TABLE 2

WebCode	Conclusions
	serial number, no country of origin. Nose areas crushed. Bases slightly out of round. All three bear foreign markings. All three are marked "1" on nose area. Item #2: One (1) 40 / 10mm caliber fired bullet with 06R consistent with conventional lands and grooves with a right direction twist. Nose area crushed, base slightly out of round. Bears foreign markings. Marked "2" on nose area. Item #3: One (1) 40 / 10mm caliber fired bullet with 06R consistent with conventional lands and grooves with a right direction twist. Nose area crushed. Bears foreign markings. Marked "3" on nose area. Item #4: One (1) 40 / 10mm caliber fired bullet with undetermined number of lands and grooves with an undetermined direction twist. Nose area crushed. Bears foreign markings. Marked "4" on nose area. Note: Rifling is consistent with 06R Polygonal LAGs. The specimen could not be fully classified due to damage. Item #5: One (1) 40 / 10mm caliber fired bullet with 06R consistent with conventional lands and grooves with a right direction twist. Nose area crushed. Bears foreign markings. Marked "5" on nose area. Conclusions: Item #1 was microscopically compared to Item #2, #3, and #5 with inconclusive results. A microscopic comparison was performed; however, there is insufficient detail of the class and/or individual characteristics for an identification or elimination finding. Item #1 was eliminated as having been fired from the same firearm as Item #4 due to differences in class characteristics.
Y8XVJ3	The projectile in Item 4 was not fired in the gun that fired the projectiles in Item 1, based on differences observed in class characteristics. The projectiles in Items 2, 3 and 5 bear class characteristics consistent with the projectiles in Item 1. Due to insufficient reproducible individual characteristics, the projectiles in Items 2, 3 and 5 could not be positively included or excluded as having been fired in the gun that fired the projectiles in Item 1.
YNKFX3	We have concluded that items 2, 3, 4, and 5 were not fired from the same gun that discharged item 1
YR63Y3	The bullet (4) is suitable for comparison. The bullet (4) was eliminated as fired in the same firearm as Items 1A, 1B, 1C, 2, 3, and 5. Possible firearms that could have fired the bullet (4) include 40 caliber firearms with polygonal rifling. The three bullets (2, 3, 5) are suitable for comparison. The three bullets (2, 3, 5) were identified as fired from the same unknown firearm. The three bullets (2, 3, 5) were neither identified nor eliminated to Items 1A, 1B, and 1C due to similarities in rifling class characteristics, but lack of repetitive and consistent matching striae.
YTEAWN	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 within items 2,3 & 5 were fired from the same firearm to the known samples within item 1. In my opinion, a microscopical comparison of firing marks has shown there is significant disagreement of class characteristic and individual characteristic markings on fired bullet within item 4, therefore the bullet was fired from a different firearm to the known samples within item1.
YTZNL2	Deformed test fired projectiles items 1A, 1B, and 1C were compared to the questioned projectiles items 2, 3, and 5 which revealed agreement of the class characteristics (caliber, number of lands and grooves, directions of twist) but insufficient agreement of the individual characteristics necessary for an identification. It is inconclusive as to whether items 2, 3, and 5 were fired in the same firearm as the known test fired projectiles, items 1A, 1B, and 1C. Deformed test fired projectiles items 1A, 1B, and 1C were compared to the questioned projectile item 4 which revealed a disagreement of a class characteristic (type of rifling). Item 4 was not fired in the same firearm as the known test fired projectiles, items 1A, 1B, and 1C.
YV79BM	Bullets identified as Item 2, Item 3, Item 4, Item 5, have not been fired by same gun that fired

TABLE 2

WebCode	Conclusions
	bullets identified as Item 1.
YZLU7F	Exhibits 2, 3, and 5 (spent projectiles) were identified as having been fired in the same .40 caliber firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for examination. Exhibits 2, 3, and 5 were not fired in the same firearm as exhibit 1 (spent projectiles from suspect's firearm), based on differences in individual characteristics. Exhibit 4 (spent projectile) was not fired in the same firearm as exhibits 1, 2, 3 or 5 based on differences in class characteristics. Suspect weapons include .40 caliber Glock pistols; however, any suspect weapon should be submitted to the laboratory for examination.
ZDLTUC	I found similar rifling class and insufficient agreement of individual marks between Items 2, 3 and 5 and the test fired bullets Item 1 for identification. Conclusion: Items 2, 3 and 5 could not be identified or excluded as having been fired in the suspect firearm. Item 4 has a different class of rifling (right twist polygonal) and was not fired in the same firearm as Item 1.
ZQUKDB	The expended bullets contained in laboratory evidence items 1.2, 1.3, 1.4 and 1.5 were microscopically compared to each other and to the fired bullets contained in item 1.1 with the following results. The expended bullets contained in laboratory items 1.3 and 1.5 were all identified as having been fired from the same firearm. The expended bullets contained in laboratory items 1.2, 1.3 and 1.5 could have been fired from the same firearm. They have the same general rifling characteristics however, a lack of detail precludes a more conclusive determination. Laboratory item 1.4 was excluded as having been fired from the same firearm that fired 1.2, 1.3, and 1.5. Laboratory evidence item 1.4 was also eliminated as having been fired from the same firearm that fired the bullets contained in item 1.1. The expended bullets contained in laboratory items 1.2, 1.3 and 1.5 could have been fired from the same firearm that fired item 1.1. They have the same general rifling characteristics however, a lack of detail precludes a more conclusive determination.
ZTEJHT	The doubted projectiles of item 2, 3 and 5 were fired by the firearm that fired the reference projectiles of item 1.
ZU8KA3	Item 2, a caliber 40 Class full metal jacketed bullet, was identified, based on corresponding class and individual characteristics, as having been fired from the firearm represented by Item 1. Items 3 and 5, each a caliber 40 Class full metal jacketed bullet, were identified, based on corresponding class and individual characteristics, as having been fired from the same firearm. Items 3 and 5 exhibit similar general rifling class characteristics as the Item 1 bullets; however, due to a lack of sufficient corresponding individual characteristics, it was not possible to identify or eliminate Items 3 or 5 as having been fired from the firearm represented by Item 1. Therefore, these comparisons are inconclusive. Item 4 is a caliber 40 Class full metal jacketed bullet and exhibits limited characteristics suitable for comparison purposes. Due to differences in general rifling class characteristics, Item 4 was eliminated as having been fired from the firearm represented by Item 1. Firearms that produce general rifling class characteristics like those present on Item 4 include the below listed firearms. Bersa, Glock, Heckler & Koch (HK), IMI, Kahr Arms and Vektor pistols chambered to fire caliber 40 Smith & Wesson cartridges. Glock pistols chambered to fire caliber 10mm Auto cartridges. This list is not all encompassing; it is possible another brand of firearm produced general rifling class characteristics like those present on this item and is not listed due to the content of the database searched. Items 1 through 5 were microscopically examined.
ZVZBFG	1. The bullet projectiles marked E-1 to E-3, corresponding to item 1, are caliber .40/10mm, with rifling to the right (R-6) and were fired by the same firearm (Identification). [Initials]

TABLE 2

WebCode	Conclusions
	09/November/2023 2. The bullet projectiles marked E-4 to E-5 y E-7, corresponding to items 2,3 and 5, are caliber .40/10mm, with rifling to the right (R-6) and were fired by the same firearm (Identification); and were not fired by the firearm used to fire the bullet projectiles marked E-1 through E-3 (Item 1). [Initials] 09/November/2023 3. The bullet projectile marked E-6, corresponding to item 4, is .40/10mm caliber, with right rifling (R-6) and was fired from a firearm. [Initials] 09/November/2023
ZWQL6P	The three (3) fired jacketed bullets Items 2, 3 and 5 could neither be identified nor eliminated as having been fired from the same firearm as the fired bullets contained in Item 1 due to the lack of sufficient agreement of individual characteristics. Item 4 was eliminated as having been fired from the same firearm as Item 1 due to a difference in class characteristics.

Additional Comments

TABLE 3

WebCode	Additional Comments
22848R	The three reference bullets of item 1 were mutually compared. The bullets show nearly no useable striation markings. Bullet item 4 shows difference in class characteristics with item 1 and could therefore not have been fired from it. Bullets items 2, 3 and 5 show agreement in class characteristics with the bullets from firearm item 1. Moderate to good agreement was found between the striation lines on items 2, 3 and 5: there are indications that these three bullets were fired from the same barrel. However, the same agreement was not found in comparison with the reference bullets from item 1. Given the low presence and reproducibility of striation markings on the reference items 1, it can, however, not be excluded nor can it be confirmed that item 1 was used to fire items 2, 3 and 5.
27FM97	1. Exhibit 1 test fires have some inconsistencies on the rifling. Some of the same inconsistencies were observed with Exhibits 2 and 5. Differences observed in general on the land impressions and striae between Exhibit 1 and group of Exhibit 2, 3, and 5, but not enough for a disagreement conclusion. Some agreement observed on the pattern of all the land impressions (around the ogive and slippage) of Exhibit 1B (test fire) with Exhibit 5. The level of agreement don't exceed as those observed on an identification conclusion, but due to the poor reproducibility of the test fires, damage observe on the bearing surface and ogive (on driving and trailing edge), poor definition on some of the trailing and driving edges of Exhibit 1 (test fires) it cannot be determined scientifically that Exhibit 1 was fired or not fired from the same firearm as Exhibit 2, 3, and 5 group. 2. Not having the firearm to produce more test fires limits the Examiner in their conclusion. It is recommended to verify the quality and reproducibility of the test fires submitted for comparison.
298JXZ	Test fires (Item 1) were of very low quality with respect to suitability for comparative analysis: Striations present were minimal due to limited contact with conventional rifling and subclass characteristics present. My normal practice in situations like this is to make additional test fires with different brand(s) of ammunition in attempt to yield test fires with higher quality markings.
2EQZAA	Item 1 tests displayed poor quality and quantity of markings with limited reproducibility.
2H7GHE	Class characteristics are consistent with respect to caliber, type of rifling and direction of twist. Examinations to determine if Items 2, Item 3 and Item 5 were discharged from the same firearm as Item 1 were inconclusive due to a lack of agreement or disagreement of individual characteristics and mutilation.
2TBEDA	The results for CTS Items 2, 3 and 5, were inconclusive, there was agreement of discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility.
2XMCWP	Please do not send damage test standards/fires in the future. We do not use damaged test standards/fires in the lab. The purpose of a test standard/fire is to have determine if the toolmarks from a firearm repeat consistently. When test standards/fires are damaged it can impede on that. The purpose of the test standards/fires is to have a pristine example for microscopic comparison.
32EY64	Item 2, Item 3 and Item 5 were discharged from the same firearm Item 4 was not discharged from the firearm discharged Item 2, Item 3 and Item 5 (different class characteristics)
3EP9UE	The bullets (test fires) were not reproduceable . The test fired bullets did not mark well, I may have tried other ammunition for the test fires.
3KQP4Y	The bullets in the trial were poorly marked and some had areas of slippage.

TABLE 3

WebCode	Additional Comments
3NFWPG	1. Identification: Based on the agreement of individual characteristics observed by microscopic comparison examination. [Initials] November/9/2023 2. The microscopic comparison examination between the bullet marked E-1 to E-6 (Item 1 to Item 3 and Item 5) with the bullet marked E-7 (Item 4), corresponding to piece 1, was not carried out due to disagreement in class characteristics between a conventional rifling (E-1 to E-6) and a polygonal rifling (E-7). [Initials] November/9/2023
43N8TU	Regarding the microscopic comparison between item 1 and 2, the result was inconclusive because there was agreement of all discernable class characteristics and disagreement of individual characteristics, but insufficient for an elimination. Regarding the microscopic comparison between item 1 and 3, the result was inconclusive because there was agreement of all discernable class characteristics and disagreement of individual characteristics, but insufficient for an elimination.
4AT876	For the Exhibits 2, 3, and 5 bullets, the class characteristics match to the Exhibit 1 bullets and there were individual characteristics that were present on Exhibits 2, 3, and 5 that were not present on Exhibit 1; however, there was not a sufficient disagreement of those individual characteristics for an elimination. Therefore, it could not be determined if the Exhibits 2, 3, and 5 bullets were or were not fired from same firearm as the Exhibit 1 bullets. TECHNICAL NOTES Class characteristics are defined as measurable features of a firearm or tool, which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm or tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm or tool surfaces. These random imperfections or irregularities can be either produced incidental to manufacture or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm or tool are not to the absolute exclusion of all other firearms or tools, because it is not feasible to examine all firearms or tools in the world. However, observing this amount of agreement between different sources is considered extremely remote.
62PKRB	CLASS CHARACTERISTICS ARE CONSISTENT WITH RESPECT TO CALIBER, TYPE OF RIFLING AND DIRECTION OF TWIST. EXAMINATIONS TO DETERMINE IF ITEMS 2 (R-1), 3 (R-2) AND 5 (R-4) WERE DISCHARGED FROM THE SAME FIREARM AS ITEM 1 WERE INCONCLUSIVE DUE TO LACK OF AGREEMENT OR DISAGREEMENT OF INDIVIDUAL CHARACTERISTICS AND MUTILATION.
66AF8N	In the test there are two firearms
6836ZG	the questioned recovered bullets identified “2”, “3” and “5” were discharged from the same firearm. An additional "Three known test-fired bullets" were used in this test. Reason: The firearm as the known test-fired bullets do not have enough information in its surface to establish the firearm impressions secuence
6DN9U6	1. Exhibit fired bullets Items 2, 3, 4 and 5 were all eliminated from having been fired from the exhibit CZ 75 P-07 pistol. 2. Exhibit fired bullets Items 2, 3 and 5 were identified as having been fired from the same firearm other than the suspects CZ 75 P-07 pistol. 3. Item 4 contained general rifling characteristics imparted from polygonally rifled barrel and was therefore determined to have been fired from another firearm other than the firearm that fired Items 2, 3 and 5 and the firearm that fired Item 1.
6VLHPV	AFTE GRC list would be attached to the report
6VQX2V	The comparison between items 1-1 and 1-2, 1-3 & 1-5 were originally eliminated as having been fired from the same CZ pistol; however, during verification, it was noted that several

TABLE 3

WebCode	Additional Comments
	small areas of agreement were observed. Although an overall lack of consistent and reproducible individual marks were found, the agreement in class characteristics and some individually striated patterned areas lead to the conclusion of inconclusive for these comparisons.
6XAYWH	Good
774GWC	Inconclusive results are due to the very limited features for comparison wich are present at recovered bullets (Item 2, 3 and 5), as much as the known test-fired bullets (Item 1). Besides the last ones bears several dents and scratches wich may had cause interferences over the continuity of their pattern. In making this comparison it was used another Item1 set of test-fired bullets corresponding to the participant code [Code].
7F63Y6	CTS Item 1 = Lab Items 1A-1C. CTS Item 2 = Lab Item 1D. CTS Item 3 = Lab Item 1E. CTS Item 4 = Lab Item 1F. CTS Item 5 = Lab Item 1G.
7FPJE8	These bullets did not mark well. Would it be possible in future times to get images of casts or some kind of information to assist with the evaluation for subclass?
7UA2AW	Items 1, 2, 3, and 5 exhibited little to no individual characteristics, making it extremely difficult to form any conclusions.
7XPVN9	The "tests" from Item 1 are poor quality with very limited marking of valuemaking it difficult to make any significant conclutions on comparison to evidence. Class characturistics between Item 1 and Items 2, 3 & 5 are not different making it impossible to eliminate.
7ZAHHG	Samples number 2 and 3 have yielded indeterminate results. Although they exhibit a considerable degree of similarity, the evidence is insufficient to conclusively determine that they originate from the test firing firearm
7ZAR4L	item 4 was not fired by the suspected firearm
86MK6C	Identification: Based on the agreement of the individual characteristic observed thought the microscopic comparison examination.
89MT9M	Strong axial mark on test fires with unknown origin - barrel cast would have been helpful. Would also include GRCs of Items 2 & 4
8C72J9	Submission 001-5 (item 1) test fires show some repeatable individual microscopic markings; however they lack detail of individual characteristics. Two of the test fires have damage at the base of some land impressions. Submissions 001-1 (item 2), 001-2 (item3), and 001-4 (item 5) lack detail of individual characteristics. It was observed that each item has one land impression with damage to the base.
8FM9YU	Difficulty indexing test fire to test fire. Little to no individual detail in LEAs for comparison on Items 1, 2, 3 and 5.
8RHCB2	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. Item 1 TFs not well marked - limited areas of agreement - same areas of agreement of individual characteristics not observed on Items 2, 3 and 5 but insufficient disagreement of individual characteristics for elimination (-ve inconclusive). In casework, would have generated additional TFs or called in firearm for exam.

TABLE 3

WebCode	Additional Comments
8WUAUG	In daily work , we use the six-level [Institute] scale. In the case of extremely similar class characteristics, when the firearm is not obtained, we use the term "it is unlikely that ballistic traces belong to the same firearm". Received ballistic traces on all three comparative bullets and on questioned bullets items 2, 3 and 5 demonstrate a stability on the basis of which a reliable assessment can be made under the given circumstances. Questioned bullet item 4 has different class characteristics from all other bullets in test.
8X2RTD	Inconclusives: Few printed marks on the analyzed surface. Test-fired and questioned bullets in some parts with damages. I also used test-fired bullets from item 1 with the code [Participant code].
984DAC	There know test fired bullets discharged from the suspects firearm in item 1 have similarity of individual characteristic with (1) fired bullet in item (2), (1) fired bullet in 3 and (1) fired bullet in item 5
98LHTA	The bullets were receive in a single item as 1, then marked E-1, E-2, E-3, E-4, E-5, E-6 and E-7, respectively, they were received packed in separate white rectangular boxes divided into “Items” 1 (E-1 to E-3), 2 (E-4), 3 (E-5), 4 (E-6) and 5 (E-7) respectively. [Initials] November/15/2023
9EK6HP	The markings present on the test fired bullets as well as the evidence bullets marked very poorly and had poor reproducibility.
9EPKVP	This proficiency test was more challenging than past tests provided by CTS. More time than usual was needed to observe the agreement of individual markings in the submitted test fires for repeatability and reproducibility as some of the areas marked poorly. This may not be a good representation as to what is commonly seen in casework, especially the use of a Ceska Zbrojovka Model 75 P-07.
9GC4WM	Controls item1 were poor, one was not a good match to other two, if it was casework our lab would have taken further test fires.
9PM7HN	The hypothesis that the same firearm fired bullets 2, 3 and 5 is supported. Items 2, 3 and 5 aren’t marked in their small labeled box when we receive this test of firearms examination.
A6BZ6Y	There is agreement of discernible class characteristics of the examined bullets from Items 1, 2, 3 and 5. However, the lack of reproducibility and lack of correspondence of patterns of surface contours in the inter-comparison of the test fired bullets from Item 1 as well as the lack of sufficient agreement or disagreement of patterns of surface contours in the microscopic comparison of the recovered bullets from Items 2, 3 and 5 is the basis for the inconclusive result of the comparison analysis.
A6FFHY	Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
A83WUT	A GRC attachment would be included as part of the report.
ALY7GY	none of the provided test fires could be indexed to one another.
AQFE6X	Class characteristics are defined as measurable features of a firearm/tool which indicate a

TABLE 3

WebCode	Additional Comments
	restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
BA3LDD	as above.
BBFWQJ	When beginning this proficiency test, my first step was to examine the Item 1 known bullets to verify replication of individual characteristics. This was extremely challenging. I labeled the bullets A, B, and C and observed some level of damage on each of them. All 3 knowns have hard scuff damage at the nose, with 1A and 1B extending to the top of the bearing surface (over the top of 1 full land impression each). The scuffs on 1A and 1C have what appears to be white/gray substrate transfer. 1B and 1C also have the same scuff damage at the base of the bullets, with the same white/gray substrate transfer on the 1C base/side scuff (it extends upward over one entire groove impression and some over the extreme base of one land impression). The scuff on 1B covers the extreme base of most of one land impression and one groove impression. I also observed what appears to be poor engagement over different areas of the 3 bullets, evidenced by the lack of defined shoulders of a few land impressions in different areas of the 3. Ultimately, I was able to index the Item 1 knowns, but if these 3 bullets were unknowns I don't feel like there would be enough suitable agreement for me to issue an identification conclusion to each other. Scuff damage was also observed at the nose areas of all the questioned bullets (Items 2-5). This damaged extends to the top of the bearing surface over both groove and land impressions, although only over 1-2 on each item. There is a small scuff at the base of one groove impression on Items 2 and 4 as well. In the course of casework, I would absolutely reshoot the Item 1 firearm prior to rendering any opinions. An email request was sent to CTS asking for more Item 1 bullets, but they were unable to provide additional specimens.
BEWJ34	Comparison of test fire to test fire had inconsistent/lack of repeatability of individual characteristics. Comparisons of test fires to recovered there was agreement of class characteristics, agreement of some gross marks and some agreement of individual fine striations within land impressions. However insufficient agreement or disagreement of individual characteristics for an identification or elimination.
BGGEHG	The projectile of item 4 was not fired by the CZ 75 P-07 firearm, inconclusive, this is due to the fact that the class characteristics of the bullets of item 4 have a different type of polygonal scoring than the bullets of item 1
BK7L6Y	EL RESULTADO DEL PRESENTE ESTUDIO MICRO COMPRATIVO, ES LA INTERPRETACIÓN DE LA NO CONCORDANCIA DE CARACTERISTICAS DE CLASE E INDIVIDUALES ENTRE LOS ELEMENTOS COTEJADOS, CON BASE EN LA COMPETENCIA DEL QUE SUSCRIBE. AL REALIZAR EL ESTUDIO MICRO COMPRATIVO SE DESCARTO LA BALA IDENTIFICADA COMO "ITEM 4", DERIVADO DE QUE ESTA PRESENTA RAYADO POLIGONAL, EN CONTRASTE DE LOS DEMAS ITEMS QUE PRESENTAN RAYADO CONVENCIONAL. LAS 3 BALAS "TESTIGO" PRESENTAN UNA CARACTERISTICA INDIVIDUAL EN UNO DE SUS CAMPOS Y QUE CORRESPONDE A UNA LINEA QUE ATRAVIESA EN SU TOTAL A DICHO CAMPO, A DIFERENCIA DE LOS ITEMS "PROBLEMA" QUE NO SE APRECIA ESTA LINEA EN NINGUNO DE SUS CAMPOS. [Translation not provided at time of publication.]

TABLE 3

WebCode	Additional Comments
BM7U9A	My opinion in this case is that there were two guns that were used. The suspect fired three shots (item 1) and it corresponds to items 2,3 and 5. While item 4 was fired from another gun
BYPDXZ	An inconclusive finding resulted from agreement of all discernible class characteristics, without agreement or disagreement of individual characteristics due to absence, insufficiency, or lack of reproducibility.
BZWNJH	The recovered bullet corresponding to Item 4 has been fired from a firearm with a polygonal profile barrel, which shows the participation of a second firearm in the events that occurred at the same scene.
BZXEXD	Item's #1, 2, 3, 5 all had the same caliber, conventional rifling, and similar rifling dimensions, however there was not enough microscopic markings to allow me to make an identification or an elimination determination. I was able to determine item #2 and #3 were fired from the same firearm but I could not microscopically establish a link to firearm #1 or to bullet #5.
CD2XAC	The item 1 test fired bullets share discernible class characteristics, but could be neither identified nor eliminated as having been fired from the item 1 firearm due to a lack of sufficient agreement or disagreement of individual characteristics and are therefore inconclusive.
CJAGAQ	The identifications of the bullets with the firearm in this case are made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
CLUH6D	Two firearms were used at the crime scene.
CMTFML	The test fires did not mark well with reproducible markings consistently throughout the test fires. The test fires and evidence items also displayed damage to the bearing surface. The evidence items were evaluated for sub-class characteristics. No significant presence/influence of potential sub-class characteristics was observed. However, at the base of some of the test fired bullets as well as some of the evidence bullets there were manufacturing markings that exhibited agreement between the test fires and the evidence.
DEAR44	Items 2,3 and 5 were marked inconclusive due to agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for identification.
DF4HAH	Item 4 has extremely shallow rifling. Items 2, 3, 5, and test shots, Item 1, all lack an appropriate or reliable quality and quantity of characteristics to reach a conclusion of identification or elimination.
DGEAGD	Methods: Pattern Examination Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks

TABLE 3

WebCode	Additional Comments
	came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
DGVGNF	The Item 2, 3 & 5 group of bullets displays the same class characteristics as the Item 1 bullets, but there is a lack of agreement/disagreement of individual characteristics. Additionally, I could not conclusively identify the Item 1 bullets to each other in test-to-test comparisons. This is a poorly designed proficiency test. At the very least, the test fired bullets should have been identifiable to each other. The lack of test to test agreement made it impossible to conclude anything definitive to the other bullet group (Items 2, 3 & 5).
DN3X83	The test-fired bullets did not demonstrate consistent reproducibility when I compared them to one another. I also noted many areas of damage on both the test-fired and evidence bullets. Finally, the quality of the toolmarks present on all items of evidence were minimal, inconsistent, and fine. Ultimately, the lack of reproducibility in the test fires, the quality and quantity of the toolmarks on the evidence items, and the physical damage to the bullets heavily contributed to an inconclusive result.
DW822E	Items 2, 3 and 5 are inconclusive with Item 1 due to an agreement of all discernable class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility.
DZPABY	I was able to find sufficient agreement between only two (2) of the known bullets. There was an overall lack of detail on the known and unknown bullets.
E3C933	Identification: Based on the agreement of individual characteristics observed by microscopic comparison examination. [Initials] November 09, 2023 The bullet projectile marked E-7 (Item

TABLE 3

WebCode	Additional Comments
	4), corresponding to piece 1, did not undergo a microscopic comparison due to the disagreement (rifling inconsistency) of the class characteristics. [Initials] November 09, 2023
EAP9D7	3.1: Three known test-fired bullets discharged from the suspect's firearm in item 1 have similarity of individual characteristics with (1) fired bullet in item 2, (1) fired bullet in item 3 and (1) fired bullet in item 5.
EJ2A4Z	Items 001-01, 001-02, 001-03, and 001-05 have poorly marked land and groove impressions with poorly defined trailing edges. Individual characteristics are limited and poorly reproduced. The items also have random damage that obscures some of the class and individual characteristics.
ETMJ6E	Test fires were poor. Had a gun been available, I would have conducted an examination and obtained further test-fires to determine if gun did not reproduce well.
EVA2MZ	Results Definitions: Consistent: Class and individual characteristics were examined and/or compared and are in agreement. Inconsistent: Class and individual characteristics were examined and/or compared and are not in agreement. Conclusions Definitions: Identification: Agreement of all discernible class characteristics and sufficient agreement of a combination of individual characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different firearms/tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool/firearm. Inconclusive: Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Elimination: Significant disagreement of discernible class characteristics and/or individual characteristics. Unsuitable: Unsuitable for examination.
EYVNH9	The results are inconcluse due to the lack of rifling marks in the item 2, 3 and 5 , as well as in the pattern bullets (item 1), in addition to the latter some dents and scratches are observed that coul have interference with the continuity of the useful rifling marks for comparision. Item 1 bullets with participant code [Participant Code] were also used.
EZ9F94	Identification: Is based on in the agreement of the individual characteristics observed through the microscopic comparison examination. [Initials] December/15/2023
FGRJEW	It was observed that all three (3) test fired bullets (item 001-AA) were damaged and poorly marked such that they could not be identified to each other & the reproducibility of the individual characteristics could not be verified or documented from test to test.
FXWZE4	Identification: Based on the agreement of the individual characteristics observed through the microscopic comparison examination. [Initials] 21/nov/2023
FY9QQT	Inconclusive Explanation: Test fired bullets (Items 1A, 1B, and 1C) were inconclusive to one another due to insufficient individual characteristics (micro) present on LIMPs; therefore, Item 1 (the CZ pistol) did not produce test fired bullets that showed reproducibility of the fine irregular micro. Due to Item 1 not having reproducibility of the individual characteristics imparted on the test fired bullets, Items 2, 3, and 5 (the questioned bullets), having the same class characteristics as the tests could not be identified or excluded from Item 1. Insufficiency of the test fired bullets individual characteristics rendered the results of Items 2, 3, and 5 when compared to Item 1 as inconclusive.
FZ2PGC	Based on microscopic comparisons, in the opinion of the laboratory: Items 1-2-1 (CTS Item 2), 1-3-1 (CTS Item 3), and 1-5-1 (CTS Item 5) projectiles could not be identified or eliminated as having been fired by the known firearm that fired item 1-1-1 projectiles (CTS Item 1). These inconclusive conclusions were based on insufficient agreement or disagreement in the patterns of microscopic markings observed between the compared items for conclusions

TABLE 3

WebCode	Additional Comments
	of identification or elimination, respectively.
G6T4X7	The known test-fired bullets discharged from the suspect's firearm contains stries and imperfections could be originated from the test firing process and not from the barrel rifling, which made them inappropriates for the compraison.
GA466V	Comparisons were conducted with various orientations and different lighting sources. Only one land impression was able to be indexed with a few stria in agreement. Some sparse gross markings appeared to be in agreement in other groove impressions. Markings observed were insufficient for an identification.
GQQQJV	The rifling impressions of the test fired bullets and the recovered bullets are poorly, and incompletely, engraved. No significant combinations of corresponding patterns of individual characteristics were observed when Item 1 was microscopically compared to Items 2, 3 and 5. The observed differences in their individual characteristics were not significant enough to support an elimination conclusion.
GQUDZ9	The Item 1 test fires were unable to be identified to each other to establish reproducibility of individual characteristics. The Item 1 test fires were still compared to the Item 2, 3, and 5. Due to the lack of detail, a definitive conclusion could not obtained. The Item 2 and 3 bullets showed agreement in the slippage marks and some areas of the LEAs that in totality rendered and conclusion of identification. The Item 5 bullet had minimal agreement (potentially random) and some disagreement, but in totality lacked enough detail for any type of definitive conclusion. Additional test fires or re-shooting the firearm with different ammunition in order to produce better samples would have been recommended, if the examiner had the firearm.
GUMJA6	The four questioned bullets (items 2 through 5) were compared microscopically to each other and to the test-fired bullets from the CZ 75 P-07 pistol (Item 1). Item 4 was not fired the same firearm as items 2, 3, and 5, or Item 1 based on differences observed in the rifling marks (polygonal rifling versus conventional). Items 2, 3, and 5 share class characteristics with Item 1; however, there were differences of individual detail observed in the rifling marks between items 2, 3, and 5, and Item 1. However, there was an insufficient amount of differences observed for an elimination; therefore, the comparison results were inconclusive. Additionally, the test fires from Item 1 were poorly marked and damaged. The remaining questioned bullets (items 2, 3, and 5) were fired in the same firearm based on class characteristic agreement observed and sufficient corresponding individual detail observed in the rifling marks.
GV8ZRR	The bullets marked with items 2,3 and 5 were fired from a very similar pistol-type firearm of caliber, .40. The bullet marked with item 4 was fired from another .40 caliber pistol-type firearm.
HTRDDB	Items 1, 2, 3 and 5 display similar class characteristics but lack sufficient individual characteristics to either identify or eliminate.
J3FBV4	The marks I observed lacked definition, quantity, and reproducibility. Based on the agreement of all discernible class characteristics and the lack of disagreement or agreement of individual characteristics due to lack of reproducibility and insufficiency, it is inconclusive whether item 2, item 3, and item 5 were fired from the same firearm. The marks I observed lacked definition, quantity, and reproducibility. Based on the agreement of all discernible class characteristics and the lack of disagreement or agreement of individual characteristics due to lack of reproducibility and insufficiency, it is inconclusive whether items 2, 3, and 5 were fired from the same firearm as item 1.
J47MGU	Note: Results Definitions: Consistent: Class and individual characteristics were examined and/or compared and are in agreement. Inconsistent: Class and individual characteristics

TABLE 3

WebCode	Additional Comments
	were examined and/or compared and are not in agreement. Conclusion Definitions: Identification: Agreement of all discernible class characteristics and sufficient agreement of a combination of individual characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different firearms/tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same firearm/tool. Inconclusive: Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Elimination: Significant disagreement of discernible class characteristics and/or individual characteristics. Unsuitable: Unsuitable for examination.
J4TXDH	I chose inconclusive due to finding some similar individual characteristics but not enough to identify or eliminate from firing in the CZ pistol.
J68DVP	Unable to come to conclusion of identification or elimination due to insufficient microscopic characteristics and not have the firearm to perform further testing.
J92GEV	The three (3) test fired bullets of Item 1 of this test could not be identified to each other on sufficient agreement of matching, individual characteristics. If a firearm was available in casework, additional test fires should be created for comparison purposes.
JBLDUA	Although Items 2, 3, and 5 could be identified together, it is inconclusive whether they were fired in Item 1 because the three test fired bullets provided were not consistently marked. There were some gross characteristics that reproduced on the test fires and there were some similar gross characteristics on the bullets in Items 2, 3, and 5 but there is no agreement of the fine striae in/around the gross characteristics. Additional test fires were requested but the request was denied. Therefore inconclusive was the appropriate conclusion unless additional test fires can be obtained to establish the reproducibility and variability in these marks.
JJP7JW	Inconclusive due to absence, insufficient detail, and lack of reproducibility of individual corresponding microscopic markings.
JJZ6K8	Methods: Pattern Examination Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the

TABLE 3

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	Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
K3VX2P	INCONCLUSIVE STATEMENT CTS: Test-fired bullets (Items 1A, 1B, and 1C) were limited in individual characteristics (micro) present on LIMPs. Due to Item 1, the pistol, not being present to cast the barrel or make additional test fires, the identified test-fired bullets, Items 2, 3, and 5 (the questioned bullets) (having the same class characteristics as test) could not be identified nor excluded from Item 1; Insufficiency of access to the the tool to produce further casts and known test-fired bullets rendered the results of Items 2, 3, and 5 compared to Item 1 inconclusive.
K4L9QW	Item #1 test fires had insufficient individual characteristics to examine reproducibility between each other - all three used for other comparisons, insufficient individual to either identify or eliminate.
K6EYWB	KNOWN TEST FIRED BULLETS HAVE WEAK CLASS AND INDIVIDUAL CHARACTERISTICS. IT MADE IT DIFFICULT TO CONDUCT COMPARISONS, EVEN BETWEEN KNOWN TEST FIRED BULLETS. ACCORDING TO OUR LAB PROCEDURE, IT SHOULD HAVE BEEN IMPORTANT TO FIRE SOME MORE ROUNDS FROM THE SUSPECT'S FIREARM, IN ORDER TO GET BETTER MARKS ON BULLETS, AND TO DETERMINE POSSIBLE DAMAGE OR DETERIORATION ON THE BULLETS, OR CHANGES IN THE BARREL OF THE PISTOL.
KPN4DT	Land borders are not so clear. There are some agremment of individual characteristic, but insufficient for an identification.
LB269C	I use internal LIMS item numbers. They correspond to the agency item numbers as follows: Item 01-01A through Item 01-01C = Item 1 Item 01-02 = Item 2 Item 01-03 = Item 3 Item 01-04 = Item 4 Item 01-05 = Item 5 All items also exhibited some poor engagement of rifling, with some land impressions on some of the bullets only being partials.
LCVX4V	All of the bullets have markings suggestive of poor engagement with the rifling, Items 1, 2, 3, and 5 show indications of poor reproduction, within the two groups correspondence of individual characteristics is sparse. Any similarities or differences between the two groups is ultimately ambiguous. I can't discriminate if the two groups are from two different firearms of similar class that both mark poorly, or if they are all from the same poorly marking firearm and there is, for example, a difference in the loadings used in the two groups (or if the bullets were cherry-picked specifically for the sake of being misleading).
LDNNAA	The test fires, designated 1A, 1B, and 1C have fair rifling marks, but they can be identified to

TABLE 3

WebCode	Additional Comments
	each other. Also, they have consistent pattern of slippage marks on their trailing edges. Items 2, 3, and 5 have consistent pattern of individual marks. Although these evidence bullets have the same class as the test fires (designated 1A—C), they have significant differences in pattern of individual characteristics. Item 4 has a polygonal rifling impression different from the conventional rifling impressions of Items 1, 2, 3, and 5.
LHGZZY	3.1. The results of the analysis of (1) fired bullet in item 2, (1) fired bullet in item 3, (1) fired bullet in item 4 and (1) fired bullet in item 5 found that it has (2) groups of individual characteristics. Therefore I think it was fired from (2) guns
MBW8BL	I was able to index the Item 1 bullets to each other however, these bullets displayed very little individual characteristics. The Item 2, 3, and 5 bullets displayed some correspondence at green dot LIMP however, insufficient for an identification. These bullets displayed little individual characteristics.
MGNGKJ	REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. o Inconclusive (-): Agreement of all discernible class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm. The submitted items will be transferred to the Evidence Section for return to your agency. Questions regarding this report should be addressed to: [Email].
MJQEVC	Reason for inconclusive result stated in conclusions. This test took a significant amount of time to complete due to the poor markings produced by the firearm and lack of reproducibility of the tests. I was very disappointed that the "tests/exemplars" from the known exhibited damage/tank rash; the damage, combined with the limited markings, hindered my ability to perform the examination. In casework, the first thing I would have done is reshoot the exemplars.
MKJEMV	Q1/Item 2. Q2/Item 3. Q3/Item 4. Q4/Item 5. K1/CZ 75 P-07 firearm
MTCKMN	The reproducible patterns of individual characteristics observed in land impressions and slippage marks on Items 2, 3 & 5 were not observed on Items 1.A-1.C. However, due to the lack of reproducibility in individual characteristics observed on the test fired bullets, I was unable to eliminate Items 2, 3 & 5 as having been fired from the same firearm as Items 1.A-1.C based on differences of individual characteristics. (all discernible class char agree)
MWFBVP	Numerous areas of damage were observed on all the bullets.
N4UKWQ	Items 2, 3, and 5 could not be identified or eliminated from Item 1(a, b, c) [known TFs] due to agreement of all class characteristics with disagreement of individual char. but insufficient for elimination - INC C. No pattern of agreement between the individual marks of Items 2, 3, and 5 when compared to Item 1(a, b, c). There was some slight or coincidental agreement observed in some of the comparisons but no pattern of agreement or consecutiveness of

TABLE 3

WebCode	Additional Comments
	individual marks were observed; and most of the comparisons of the LEAs amongst the evidence bullets against the TFs displayed disagreement; however, this disagreement did not rise to the level of significance for elimination, as other factors could not be ruled out. Cannot definitely say that differences observed were made from diff. FAs or if they were caused by other reason(s): Condition of tool – could not be determined; inability to examine barrel; FA unavailable. Condition of substrate: poor quality in some areas of bullet surfaces Time of event to analysis factors: same day but gap in time ("later")-could not rule out poss. change of FA (Ex. cleaning) from time of even to time of TF, thus poss. change in individual marks transferred to bullets. History of tool -unknown, see above. Number of Items: 3 TFs and 3 evidence bullets. [would have taken more TFs if possible to look for consistency in other areas for better representation of all LEAs' individual marks.]. Consistency and reproducibility of individual char.: some repro in Item 1 TFs but incapable of taking more TFs (no access to FA) for further analysis of areas that were poor – not all LEAs were repro; areas of poor consistency in evidence items (2, 3, and 5 - not ID'd to each other) Items 2, 3, and 5 could not be identified or eliminated to each other due to agreement of all class char. with some agreement of individual char. but insufficient for identification -INC A. Between Items 2, 3, and 5, double gross marks at the base of one of the LEAs were used for phasing, and other areas of some agreement were observed around the 3 bullets while in phase. However, these marks were insufficient for ID. They lacked the quality and quantity required in the AFTE Theory of Identification for ID. The areas that agreed lacked enough consecutiveness in the striae (too many breaks between fine and/or gross marks; quality of marks different b/t bullets) or definitive pattern to make an identification. Observations contributing to conclusions (Items 1, 2, 3, and 5): All bullets exhibited poor engagement with rifling, especially in the GEAs and center of the LEAs (which had random & inconsistent individual char. when present there). GEAs on all of these bullets (Items 1, 2, 3, and 5) exhibited very few individual marks, as those areas were not well engraved by rifling; did not engage with the rifling in any consistent or abundant manner, and striae present were sparse. All marks in these areas were poor quality. The GEAs of the Item 1 TFs were not reproducible; insufficient. Each LEA had engagement at both ends of the shoulders of the lands which extended the length of the bearing surface, but not the center (between shoulder ends). Center of LEAs lacked engraving of rifling in many places, thus those areas were not comparable, limiting areas in LEAs capable of comparison quality. The individual marks in the LEAs where the rifling did engage (shoulder ends) were very shallow and exhibited some discoloration and/or inconsistency of color (ranging b/t brassy, coppery, and/or burned or darkened appearance), all of which obscured individual marks and clarity; some had "wiped out" appearance in areas. The overall quality and quantity of individual char. were fair-poor on the evidence bullets (depending on area), and some areas of the Item 1 TFs (although +Repro was observed to a sufficient degree in some LEAs of these TFs). Other factors limiting the quality of the comparisons were copper jacket tearing in random areas near the base of some of the bullets, and "chewed up" appearance at the base of some of the LEAs which left individual marks insufficient and/or missing in those particular areas. This event did not occur in same LEAs of all the bullets while in phase, but rather randomly. Additionally, all bullets from every item (1 thru 5) had a scuffed flattening at the nose end (consistent with bullet hitting bottom of tank) which extended to the ogive, thus wiping out any individual char. in that particular area of each bullet.
N8F7QY	Samples number 2 and 3 have yielded indeterminate results. Although they exhibit a considerable degree of similarity, the evidence is insufficient to conclusively determine that they originate from the test firing firearm

TABLE 3

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NCA4E6	Observed agreement in gross characteristics and in class characteristics between each test fire and between bullets 2,3,5. Observed poor reproduction of individual characteristics between test fires and additionally between bullets 2,3,5. Too few corresponding individual characteristics observed to identify or eliminate.
NPELP6	Item 1 bullets marked poorly & showed signs of poor rifling engagement. Several LI/GI were poorly defined or had no definition. Additionally, several areas of the LI/GI at the base were lost due to damage from test firing.
NRZ48P	The test fired bullets exhibited very limited individual characteristics; therefore, reproducibility could not be established. In addition to a lack of firing marks for comparison, the test fired bullets exhibited heavy seating marks from the mouth of the cartridge cases they were fired from. These marks contributed to the poor quality of the comparable marks. In addition to the lack of reproducibility among the test fired bullets, the evidence bullets themselves exhibited very limited individual characteristics for comparison purposes. The bullets received were easily the most poorly marked items I've ever received in a CTS proficiency test.
NY2KFA	Bullets exhibit signs of tank damage (paint transfer, flattened portions, bulging at nose)
P93Z6E	The Item 1 known test fires could not be identified to each other when intercompared due to damage as well as variability in the way each fired bullet marked, particularly in shoulder areas between land and groove impressions as well as due to some damage. The verifying examiner as well as a third examiner brought in for consultation by the verifying examiner also agreed that the Item 1 test fires could not be identified as having been fired from the same firearm. Therefore, the known test fired samples provided were inadequate for ground truth samples. The amount of damage present on this test's known samples was also concerning. In casework, an examiner would be able to make additional test fires (and in pristine condition) for comparison purposes. However, due to the limited and damaged sample size provided by CTS, conclusions beyond inconclusive could not be reached for the questioned evidence items having similar class characteristics as the Item 1 Knowns.
PAWQBU	The Quality of the samples was appropriate. The difficulty of the test was rated as hard.
PC7VPH	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
PCM2Z2	Methods: Physical and Visual Examination Physical and visual examinations compare the observable features and class characteristics of evidence items. A conclusion of "physically consistent with" is reached if the observable features or measurable dimensions and/or 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 features or measurable dimensions, the result is inconclusive. General Rifling Characteristics The appropriate GRC measurements are entered in the database, which then returns a list of all firearms in the database with compatible GRCs. Pattern Examination Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the

TABLE 3

WebCode	Additional Comments
	examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Physical and Visual Examination: Physical and visual examinations compare the observable features and class characteristics of evidence items. A conclusion of "physically consistent with" is reached if the observable features or measurable dimensions and/or 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 features or measurable dimensions, the result is inconclusive. General Rifling Characteristics: The GRC, AFTE, and NIBIN databases contain information obtained from firearms at the [Laboratory] and from voluntary law enforcement partners. 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. Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
PDEBVN	The Exhibit 1 "test fire" bullets that were submitted in this test were very poorly marked and were unable to be identified to each other. They also all had damage to the ogive area where it appears the bullets came into contact with a hard surface, such as the ramp of a water tank,

TABLE 3

WebCode	Additional Comments
	destroying and/or altering some of the information that would normally be present at the ogive end of the land impressions. Ideally, test fired bullets would not be damaged in any way, especially not in any fashion that would limit the amount of information present to conduct a proper microscopic comparison. If this was real casework, additional test fires would be created using the suspect CZ firearm to collect undamaged samples, as well as find better reproducibility in the markings that are left behind on the bullets. Even if going under the assumption that the three Exhibit 1 bullets should be identified to each other, since the information given states that they were test fires from the suspect firearm, they were so poorly marked that there was not enough information present to render any conclusion when comparing them to the Exhibit 2, Exhibit 3, and Exhibit 5 bullets, resulting in an inconclusive conclusion for each of those comparisons. This is largely in part due to the lack of reproducibility observed in the land impressions of the Exhibit 1 bullets. If this reproducibility cannot be observed on items that are supposedly from the same firearm, then those markings are unreliable and should not be used to render any sort of identification or exclusion conclusion when comparing to markings found on other evidence.
QAUPFL	I found this test particulaty difficult due the lack of reproducibility of individual characteristics in the test/unknown bullets and the damage on the bullets.
QBMCHP	Examinations showed the class characteristics of three (3) test fired bullets were consistent with respect to the width and number of the lands and grooves and direction of rifling twist; however, examinations of the three (3) test fired bullets to each other were inconclusive due to the lack of agreement. In laboratory casework, if the firearm was available, additional tests would be created with like and different ammunition for additional comparison purposes before an identification or elimination would be made.
QMFVWV	The questioned recovered bullets labeled "Item 2", "Item 3" and "Item 5" were discharged from the same firearm.
R396W7	Items 2 and 3 did not exhibit enough agreement or disagreement in the individual characteristics to determine if they were fired in the same firearm as Item 1. Item 5 did not exhibit enough agreement or disagreement in the individual characteristics to determine if it was fired in the same firearm as Item 1. Item 5 exhibited poor individual characteristics. Item 1 exhibited poor individual characteristics among the three submitted test fired bullets.
R8NDK7	The Items 01-02, 01-03, and 01-05 bullets were compared to the Items 01-01 bullets and were unable to be identified or eliminated as having been fired from the same firearm as those bullets due to agreement of all discernible class characteristics with both agreement and disagreement of individual characteristics. Specifically, one of the most prominent pattern areas present in on the Item 01-01 bullets were not observed on Item 01-02, 01-03, or 01-05; however, a possible orientation was established between one of the Item 01-01 bullets and 01-05. Ultimately, the correspondence or dissimilarity of pattern areas present was not sufficient to affect either an identification or an elimination.
RACUWY	Items 2,3, and 5 have agreement of class characteristics with the Item 1 test fires. The Item 1 projectiles have sufficient agreement to support reproducibility. The Item 1 projectiles lack sufficient agreement or disagreement with the Item 2, 3, and 5 projectiles. A conclusive opinion maybe possible if the gun was available to test fire different types of ammunition.
RUEVUN	*Agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for an elimination. The areas of correspondence found on the Item 1 bullets (1A, 1B and 1C) were not found on Items 2, 3 and 5. Likewise, the areas of correspondence found on Items 2, 3 and 5 were not found on 1A, 1B and 1C. However, identifying Items 2, 3 and 5 to each other was not easy and neither was intercomparing 1A,

TABLE 3

WebCode	Additional Comments
	1B and 1C. I do not consider the bullets in either group to be well-marked, especially 1A, 1B and 1C. If I had the gun represented by Item 1, I could fire more tests as well as examine the barrel.
T34PJ7	Overall poor quality of marks on all samples. All items, including test fires, have some damage, lack of shoulder definition, and irregularity in marks. Unacceptable condition of samples for a proficiency test. Some agreement noted on samples when intercompared (black and red index marks placed on items). However, agreement not sufficient to identify and disagreement observed not significant enough to eliminate. More agreement noted on intercomparison of Items 2, 3, and 5 than when those items compared to Item 1 (test fires), however, test fires were not able to be identified to one another so no inference is made on the significance of this observation in relation to the source of the markings since agreement between any of the items does not meet the threshold for an identification. The possible rifling being in disagreement and the overall disagreement/lack of patterns of agreement between Item 4 and Items 1 (test fires), 2, 3, and 5 substantiated an elimination. All items have overall poor quality of marks. Item 4 does not have defined rifling, although it does appear to be polygonal rifling and disagreement to other items noted. Items 1 (test fires), 2, 3 and 5 have a defined leading shoulder near ogive whereas Item 4 does not have any shoulder definition around entire bearing surface of bullet. Additionally, although there are voids where there is no shoulder near the base of Items 1 (test fires), 2, 3, and 5 the land impressions where voids exist do not replicate for more than one land impression in a row. Although apparent rifling is different, the elimination of Item 4 to 1 (test fires), 2, 3, and 5 is also substantiated on individual characteristics.
TA48YH	The Exhibit 1 purported test fired bullets did not accurately represent casework test fired bullets. In casework, test fired bullets would be in pristine condition and void of any damage. The Exhibit 1 purported test fired bullets included damage to both the base (Exhibit 5) and ogive. The individual marks on each of the purported test fires were scarce and in casework I would have shot more than three times, with different ammunition, in order to observe additional reproducibility. The purported bullets were also labeled with permanent marker and not scribed, which can easily be wiped off and the Exhibit number be recorded incorrectly. With the purported test fires being of low quality it made the test difficult to compare. If the purported test fires are supposed to be known matches and its hard to ID those to each other, the possibility of making any conclusion to an unknown bullet will be difficult even before microscopically examining the bullets. Exhibit 2, 3, 4, and 5 were also poor quality with a lack of individual characteristics to observe. Each bullet had damage and was labeled with permanent marker as well.
TJTVV7	Items 2, 3, and 5 were found to be inconclusive to Item 1. Factors contributing to this conclusion are as follows: Difficulty matching known test-fired bullets. Not having a firearm to test fire other ammunition. Typically, additional test fires would be created with different brands or types of ammunition to further the examination. Insufficient agreement/disagreement of individual characteristics.
TK7P8Y	The test fired projectiles, within Item 1, displayed agreement of class characteristics with the fired projectiles, Item 2, Item 3 and Item 5, but did not mark very well. Not enough agreement of individual characteristics in a pattern was observed to identify and not enough disagreement was observed to eliminate.
TKNFH6	Item 1 (knowns) were difficult to index with very little detail, slippage was occurring with lots of variations of the marks from test to test. Would have obtained additional test fires. Items 2, 3 and 5 were inter-compared and were able to be indexed, but the amount of agreement was insufficient for an identification to one another.

TABLE 3

WebCode	Additional Comments
TQTEUU	The reproducibility of the individual characteristic markings is poor amongst all three test-fires with one not marking as well as the other two. In addition, all three test-fires show some partial LEAs, which are not present in Items 2,3 and 5. This is insufficient detail for elimination purposes. However the lack of reproducibility of individual characteristic markings has led to an inconclusive conclusion.
UEAACW	Item 001 bullets exhibited damage to some land impressions and limited individual characteristics on the land and groove impressions for microscopic comparison. The Item 001 bullets could not be indexed to each other; therefore, the reproducibility of markings on Item 001 could not be determined.
UG2J8J	The bullets for this test were created extremely poorly for the purposes for a proficiency test. An appreciation can be attached to the idea of tests being made more challenging, rather than ones less challenging sometimes made in the past. However this test reflects a poor commitment to quality on the part of CTS. The bullets clearly had poor engagement with the rifling leading not so much a difficulty of finding agreement/disagreement - but rather finding foundational reproducibility. It is well understood in the field of Firearms Identification that establishing marks are reproducible is essential in order to form any source conclusion. And the test fires failed to reliability reproduce any marks, necessitating a conclusion of inconclusive in regards to comparisons to the test fires. In casework, if test fires failed to demonstrate reproducibility the firearm can be re-test fired, taking into account condition of the firearm and possible ammo substitutes. The work product demonstrated here calls deeply into question the ability of CTS's vendor ability to produce proficiency tests necessary to ensure quality assurance of the field. This test was not hard - it was very easy to render a conclusion of inconclusive - not because I couldn't tell, but because it was the right answer.
UGMWVW	Very difficult comparison of controls in item 1 - did not feel like I had properly matched them - in a real case I would have test fired the gun many more times to produce further controls. With the exception of bullet item 4 (different class marks) all of the comparisons were challenging - the match between bullets in item 2 and 3 was not strong, and there were not similarities or differences between bullets item 1 and bullet items 2, 3 and 5 to allow a definitive inclusion or exclusion.
UHUADY	Items 2-2-1 (CTS Item 2), 2-3-1 (CTS Item 3), and 2-5-1 (CTS Item 5) bullets could not be identified or eliminated as having been fired by the same firearm that fired item 2-1-1 (CTS Item 1) bullets. These inconclusive conclusions were due to insufficient similarities and insufficient differences observed in the patterns of microscopic markings for conclusions of identification or elimination, respectively.
UKM63T	Both the bullets fired, collected from the suspect’s firearm and the bullets of Items 2, 3 and 5 provided have rifling marks that does not allow a result to be concluded.
ULGQVJ	The individual characteristics on the test fired bullets were lacking in detail and reproducibility. The questioned bullets were only slightly better. Several of the exhibits had damage in areas of interest.
UNMCL6	The test fires from Item 1 are poor quality, have poor rifling engagement, minimal individual detail, and were unable to be ID'd to each other. Item 4 also had poor rifling engagement.
UUMVJU	1. The submitted fired bullets 2, 3 and 5 were fired in the same firearm. 2. The submitted bullet 4 had polygonal rifling and based on the different class characteristics; it was eliminated from bullets 1 and 2. 3. The submitted bullets 1 and 2 had the same class characteristics but different individual characteristics; it was eliminated as being fired in the same firearm.

TABLE 3

WebCode	Additional Comments
UV6HHC	The Item 1 test fired standards were damaged on the nose as well as some areas of the bearing surface. Incomplete rifling was observed. Test fired standards should be in a pristine condition and since we as test takers do not have the firearm to evaluate the rifling/clean the barrel and create new test fired standards, it is suggested to choose a firearm that reproduces better markings.
VERQTC	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote. Exhibits discussed in the forensic discipline reports were examined; all results are accredited and formed using accepted scientific and professional practices. The[Department]t is accredited under [Accrediting Body]. See certificate number [Number]) issued by [Accrediting Body].
VHBNK9	What is the deal with the ground down surfaces on the nose and some skid marks on the base of some of the projectiles?
VPB8KH	The sample items/test fires provided for this test marked extremely poorly and did not exhibit sufficient reproducible individual characteristics to even establish reproducibility between the knowns themselves. If this were case work, I would have test fired the firearm with different ammunition and simply more times to compare additional test fires to see if there was reproducibility. Areas of these test fires were also damaged, limiting the areas for comparison.
WCG98K	1. Identification: Based on the agreement of individual characteristics observed by microscopic comparison examination. [Initials] November/09/2023 2. Microscopic comparison was not made between the bullet marked E-1 to E-6 (Item 1 to Item 3 and Item 5) (with conventional rifling) with the bullet marked E -7 (Item 4) (with polygonal striation), due to incompatibility of class characteristics. [Initials] November/09/2023
WE8ABN	Reason for inconclusive - items #2, #3, and #5 share class characteristics with item #1. There is a difference of individual characteristics, however, this difference is insufficient for elimination.
WKPRJP	The questioned bullets (Item 2, Item 3 and Item 5) from the scene were microscopically compared with the test-fired bullets (Item 1A, 1B and 1C). The results of these comparisons were inconclusive. Although the firearm-related class characteristics agree, no significant amount of correspondence of individualizing detail was observed between Item 2, Item 5 and the test-fired bullets (Items 1A, 1B and 1C). Items 2 and 5 may have been fired from the same firearm as the test-fired bullets (Item 1A, 1B and 1C) or from another firearm with a barrel with similar class characteristics. The firearm-related class characteristics of Item 3 and the test-fired bullets (Item 1A, 1B and 1C) agree. Although there was some correspondence of individualizing detail observed between Item 3 and the test-fired bullets (Items 1A, 1B and 1C), it was insufficient for an identification. Item 3 was likely fired from the same firearm as the test-fired bullets (Item 1A, 1B and 1C), or it may have been fired from another firearm with a barrel with the same class characteristics as the firearm that fired Items 1A, 1B and 1C. The firearm-related class characteristics of the questioned bullet (Item 4) were compared with the firearm-related class characteristics of the test fired bullets (Items 1A, 1B and 1C). Based

TABLE 3

WebCode	Additional Comments
	on differences in the firearm-related-class characteristics, Item 4 could not have been fired from the same barrel as the test fired bullets (Items 1A, 1B and 1C).
WNCJGD	If I was working this as casework and had the firearm, I would have made numerous additional test fires in order to establish reproducibility. The test fires received as Exhibit 1 did not reproduce, and that severely limited what I could do when comparing them to the other Exhibits. In addition to the lack of reproducibility among the test fires, the other Exhibits didn't mark very well either. Some were lacking full land impressions which made even measuring for GRC difficult. There was also damage at the base of many of the Exhibits that may have been covering areas of individual characteristics within the land impressions.
WP7XCH	The test-fires were extremely poorly marked and lacking detail and clearly defined shoulders. If these tests are to be done as a case would be, no way would an examiner not generate more that 3 test-fires with various types of ammo, especially when they marked as poorly as these did.
WRBVDD	Exhibit 1, which consisted of three test fired bullets with several abrasions/gouges on their bearing surfaces and ogives. It is critical that the examiner ensures that test fired bullets are not damaged excessively, as this leads to lost comparable detail. Some of the larger abrasions began at the ogive and continued towards the base of the bullet's bearing surfaces. If a firearm is held at an angle too low inside the shooting port of a bullet recovery tank, the test fired bullets will hit the inner rim of the shooting port entrance, leaving wide large abrasions on the bullet known as tank rash. It is critical that the examiner ensure that test fired bullets are not damaged unnecessarily. These test fires should have been created again, as this damage could have been avoided. In addition to this, these test fires had no significant reproducible individual detail. However, there are several areas of information missing due to abrasions and damage from tank rash. New test fired bullets may reveal more information. Because these test fires marked poorly and had excessive damage on their surfaces due to the way they were test fired, the test fires should have been re-created. In addition to those tank rash abrasions caused by the shooting port, there were also several deep gouges that ran parallel to the long axis of the fired bullet's bearing surfaces. These abrasions were also seen on all the questioned items as well. They were positioned randomly among both the land impression areas and the groove impression areas. While it is understandable that we can't control the damage or unusual gouges are on questioned bullets, when an examiner is actually creating their known test fires with an actual firearm, I would expect any examiner to make sure they understood how any unusual random gouges are formed on their test fired bullets and make note of that if they don't re-create the test fired bullets. These gouges were randomly positioned on these test fired bullets, in addition to tank rash and poor individual characteristics that did not reproduce. One gouge from a LEA would have similar agreement with one gouge from a GEA, indicating that something possibly unusual happened before, during, or after test firing. Regardless if it is from the barrel or not, an examiner would recognize these inconsistencies on actual test fires, and at a minimum make note of them or recreate the test fires. However, because these samples are already test fired, I was unable to determine how or why they were there. Again, test fires should not have damage (tank rash) that could have been avoided, and if because they also lack individual reproduceable detail, then an examiner would want to account for those deep gouges randomly created. Many of these deep gouges had one similar characteristic of a built-up edge on one side towards the direction of the bullet's nose. If somehow this was a built-up edge, it could indicate that these gouges were made in a direction that was opposite from the direction of the bullet's path down the barrel. Because these test fires did not reproduce individual characteristics and had tank rash, along with random gouges, they should have at least been recreated without the

TABLE 3

WebCode	Additional Comments
	tank rash. Many of the questioned exhibit items had these randomly placed deep gouges, (which it is understandable on questioned bullets because we cannot control what damage is done to questioned bullets). However, any examiner would recognize inconsistencies on their own test fired bullets and at a minimum make note of it, along with avoiding the excessive tank rash. It is critical to understand how the firearm is marking when we have the opportunity to examine it and its test fires, and also avoiding tank rash. Exhibits 2, 3, and 5 had sufficient agreement of fine shallow individual characteristics at the base of their lands, and those areas were used to determine that they were fired from the same firearm. The random gouges were not used for final conclusion purposes. Item 4 had shallow, but obvious different style of rifling from the others. But it did have some hints of deep similar gouging at random areas of its bearing surface. It was undetermined if the random gouges were made before or after the firing of the bullets. If they were made after rifling, the obturation and engagement of the bullet traveling inside the barrel would cause the rifling marks from the barrel to overwrite any previous marks/artifacts on the bullets. However, if these unusual gouges were created before firing, it may be possible that they still remained on the bearing surfaces partially as the rifling on all these items were very shallow. If rifling is very shallow, it may be possible that it did not engage with the bullets bearing surface fully enough to overwrite previous deep gouge markings. These are just notes/comments, and it was unable to be determined exactly how they were formed.
XAR2MN	The bullets recovered as item 2, item 3 and item 5 have a few printed marks, with bumps in areas that do not allow them to be associated or ruled out with the suspect's firearm (Item 1).
XBMU7E	Poor reproducibility of individual characteristics observed in test fired samples (item 1). Having the firearm to examine and produce additional test fired samples may have provided the additional data needed to report a more conclusive result for items 2, 3, and 5.
XE43UD	Limited fine detail present in the test-fires. Limited fine detail present in the bullets, 2, 3, and 5.
XTNHXD	1. Test set 1-3 x .40S&W test fired bullets were examined. ID between FBs was achieved, however the carry-over of identifying marks between the three test FBs was poor. Two consecutive LEAs had bottom shoulders that did not extend the length of the FB, however, were initially used as orientation points. Some damage and additional marks noted on each FB (The three test FBs determined to have been from Firearm 1). 2. Exhibit sets 2, 3 and 5 - These bullets had similar class characteristics to test bullets; however individual characteristics were not suitable for identification. An inconclusive result due to the poor carry-over of marks within the test set of FBs. 3. Exhibit set 2 - this FB was not identified to FBs from exhibit sets 3 and 5. 4. Exhibit set 3 and 5 - these two FBs were identified to each other only, indicating possible second firearm (Firearm 2). There were some striations in upper shoulder of the identifying LEA, with carry-over of more markings to other LEAs when in phase. 5. Exhibit set 4 - this FB was eliminated from both the test set and exhibit sets 2, 3 and 5. This FB had very poor markings and appeared to have polygonal rifling (Firearm 3).
XUWQTQ	If firearm was present in lab, additional test fires would be conducted for further microscopic comparison. Both evidence and test fire specimen marked poorly with limited individual characteristics present.
XWKBM2	The rifling present on all bullets is very poor with minimal fine striated IC present within the limps. What little detail is present is mostly along the driving edge of the rifling. In many instances the rifling widths could not be visualized due to the poor engagement with the rifling. This is also true for item 1.4, which is a polygonally rifled bullet. The only indications of any rifling for this item are small scalloped areas along the base of the bullet. These flat spots

TABLE 3

WebCode	Additional Comments
	from the limps can be felt physically manipulating the bullet, but it is very difficult to visualize even under magnification. Results are inconclusive due to poor quality and a lack of reproducible IC.
XXDBDK	Test fires were poorly marked and were extremely difficult to index. The ability to create additional test fire samples could have helped in making an identification or elimination conclusion.
XY683E	The comparison became a little difficult since there are few reproducible marks between the barrel and the bullets taken as a pattern and those of items 2,3 and 5.
XZ4BZW	The three test fired bullets listed as item 1 could not be identified test to test.
Y2CTKD	The test fires in Item 1 had a limited number of quality striation.
YNKFX3	This test was very challenging in terms of distinguishing between the items. The Land Engraved Areas (LEAs) of Item 4 were not as deep, making it difficult to compare each other.
YR63Y3	The rifling impressions on the three bullets from Item 1 are not very well defined and with limited striae agreement. In my opinion, the test fires provided were not adequate for comparison and the agency should be contacted in order to provide us with the firearm to generate additional test fires with different ammunition. The inability to generate additional test fires along with the similarities in rifling characteristics, but limited individual agreement resulted in an "Inconclusive" opinion between Items 2, 3, and 5 when compared to the three bullets from Item 1.
YTZNL2	The test fired projectiles and questioned projectiles 2, 3, and 5 were very poor quality, with the markings on all the projectiles being insufficient in both clarity and quantity. Both the analyst and the verifier were unable to match the test fires to each other, in addition to being unable to match them to the questioned projectiles. If this had been a real case, the firearms examiner would have asked for additional test fires, or asked for the firearm to be submitted so they could create their own test fires. Additionally, all the projectiles showed signs of damage, particularly the question projectiles. The nose was flattened on one side indicating that they probably struck the bottom of the firing tank when they were being created.
YV79BM	Bullets received for this test have multiple marks exogenous to the barrel of the firearm. In the case of item 1, the presence of these marks is considered, within our laboratory, as a poor process for creating samples for comparison. For example, our laboratory avoids automated recovery systems that produce this kind of problems (like some types of automatized water recovery systems).
ZDLTUC	Similar class of rifling on items 1, 2, 3 and 5, insufficient agreement or disagreement of marks. Item 4 can be excluded on rifling class (polygonal v conventional)
ZQUKDB	during comparison of the items contained in 1.1 (test fires) there we minimal areas that were well marked, or contained sufficient areas for comparison. due to the lack of reproducible areas for comparison on the test fires, no definitive conclusions could be made regarding the items for additional comparisons contained in items 1.2, 1.3 and 1.5. Item 1.4 was a class exclusion based on rifling type.
ZTEJHT	The item 4 projectile was not fired by the firearm that fired the item 1 reference projectiles.
ZVZBFG	Identification: Based on the agreement of individual characteristics observed by microscopic comparison examination. [Initials] 09/November/2023 The bullet projectile marked E-6 (Item 4) was not compared with the bullet projectiles marked E-1 through E-5 and E-7 due to disagreement in the class characteristics of the bullet projectile marked E-6 (Item 4) (Polygonal Rifling) and the class characteristics of bullet projectiles marked E-1 to E-5 with E-7 (item 1, 2,

TABLE 3

WebCode	Additional Comments
	3 and 5) (Conventional Rifling). [Initials] 09/November/2023
ZWQL6P	The quality of the fired bullet specimens contained in Item 1 were substandard. Specimens that are purported to be test fired specimens should be pristine and undamaged. This was not the case for the samples contained in Item 1. There was damage observed on two of the specimens which supports poor quality control. The unknown specimens contained in Items 2-5 were of better quality in my opinion than the knowns in Item 1.

-End of Report-
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

Test No. 23-5262: Firearms Examination

DATA MUST BE SUBMITTED BY **Dec. 18, 2023, 11:59 p.m. EST** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A WebCode: YQUBR7

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

Scenario:
Police recovered four bullets from a crime scene and seized a CZ 75 P-07 firearm from a suspect's possession who was apprehended later that day. Three rounds of PMC .40 S&W 180 grain FMJ-FP ammunition (consistent with the bullets found at the scene) were test fired with the suspect's firearm and the bullets collected. Investigators are asking you to compare the recovered bullets from the scene with those test fired from the suspect's firearm and report your findings.

Please note the following:
- Each Item is in a small labeled 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.
- Items are marked in Black Permanent Marker. Please be aware when handling/cleaning.

Items Submitted (Sample Pack F2):
Item 1: Three known test-fired bullets discharged from the suspect's firearm.
Item 2: Questioned recovered bullet.
Item 3: Questioned recovered bullet.
Item 4: Questioned recovered bullet.
Item 5: Questioned recovered bullet.

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

Item 2	Yes ○	No ○	Inconclusive* ○
Item 3	Yes ○	No ○	Inconclusive* ○
Item 4	Yes ○	No ○	Inconclusive* ○
Item 5	Yes ○	No ○	Inconclusive* ○

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

Please note: *Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.*

2.) What would be the wording of the Conclusions in your report?

3.) Additional Comments

RELEASE OF DATA TO ACCREDITATION BODIES

The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and/or 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 below must be completed.)
○ This participant's data is **not** intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

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

Authorized Contact Person and Title

Laboratory Name

Location (City/State)

Collaborative Testing Services Inc

office: 21331 Gentry Drive Sterling, VA 20166 USA
voice: 571-434-1925
mailing address: P.O. Box 650820 Sterling, VA 20165
websites: CollaborativeTesting.com CTSForensics.com

Worldwide Interlaboratory Testing Programs Since 1971

This document is intended to provide information regarding our production processes, quality control measures, determination of assigned value, participant demographics, and report statistics to address the questions and concerns that we received in response to CTS Test 23-5262: Firearms Examination. Any accreditation information presented below is for demographic purposes only; in the interest of protecting the confidentiality we promise to all test-takers, CTS did not and will not provide any participant-specific information to third parties.

What quality controls does CTS have in place for the production of Firearms Examination tests?

CTS staff are directly involved in every stage of the production of our firearms tests. Prior to production, CTS works directly with an ISO/IEC 17025 accredited host laboratory with AFTE-certified examiners to evaluate firearms from their collection for performance and similarity or dissimilarity in class characteristics. Trials are completed with both the firearms selected and a variety of ammunition prior to determining the final materials to be used in the test. Thorough planning details how many rounds each firearm must fire, and that quantity is separated into production batches. Production batches are small subsets of rounds that have been fired consecutively to eliminate the possibility of a sample set containing associated bullets that have been fired far apart from each other.

At the host laboratory, CTS staff ensure only one gun is being used at a time, track ammunition use, collect and verify counts of the expended ammunition, confirm completion of verification, and seal all materials from one batch in clearly labeled packaging prior to the start of the next batch. Once all required rounds are fired from a gun, it is removed from the area, all counts are reconfirmed, and the expended ammunition is sealed. Separate packaging is used for the ammunition from each gun.

Verification is completed after each batch is fired. Ten percent of each batch is selected at random and evaluated for consistency, reproducibility, and quality by the subject-matter experts of the host lab prior to the start of the next batch. In the rare occurrence that a gun is found to not be performing adequately after any batch, the production is halted, and CTS staff determine the necessary actions to resume satisfactory production. During the verification for Test 23-5262, the experts did not indicate that the gun was not performing adequately.

Prior to final item packaging at CTS, the materials from each gun are kept separate, and as each gun is processed, only one batch of expended ammunition is opened at a time. The materials are inspected, and any ammunition that does not meet CTS' final quality control checks is removed. For Test 23-5262, bullets from the Item 1 known gun and the Item 4 gun were rejected at an overall rate of 1%, which is not atypical. The bullets from the gun used for Items 2, 3, and 5 were rejected at a slightly higher overall rate of 3%.

Ammunition is individually labeled with their assigned item number prior to packaging. Two staff members are present during this stage of production; one marks the ammunition, and the other confirms placement into the correct item box and seals the boxes. Once the batch is completed, the remaining ammunition is sealed. All packaged items from the same batch are maintained with their batches.

During the final sample set assembly, one of each packaged item is placed inside the sample pack box, making sure to select the items from the same batch as appropriate. This ensures that when participants are evaluating their materials where an association is expected, they have bullets that were fired within a small subset of rounds, and not as much as 2000 rounds apart. For example, in Test 23-5262, the boxes selected for Items 2, 3, and 5 were from the same batch when packaged into their sample pack boxes.

In a review of the production process, CTS confirms that all aspects of this quality control process were completed for Test 23-5262, including the 10% in-process checks by the host laboratory's AFTE-certified personnel, the segregation between firearms, the integrity of the lot packaging at the host lab and in transit to CTS, and the segregated division into final sample packs intended for participants.

Why did CTS include both elimination and inconclusive as assigned values for Items 2, 3, and 5 in the 23-5262 Firearms Examination test?

CTS follows the guidance of ISO/IEC 17043 for the determination of assigned values, utilizing as many of the five prescribed methods as possible depending on the discipline. For firearms-related proficiency tests, CTS is able to determine assigned value based on formulation, results from one laboratory, consensus value from expert laboratories, and consensus value from participant results. In the majority of our tests, all four of these methods produce the same assigned value. For the 23-5262 Firearms Examination test, there were some variable results, which were not completely atypical for this discipline.

Formulation:

- The design and production of the test was that the gun that fired the Item 1 known bullets was not the gun that fired the bullets provided in any of the questioned Items 2, 3, 4 and 5.
- The gun that fired the bullets in Items 2, 3, and 5 was of similar class as the gun that fired the Item 1 known bullets. This is a key point to understand, given that within the firearms community, some laboratories have policies against elimination when evidence has similar class characteristics and the gun is not available for direct examination.
- The gun that fired the bullets in Item 4 was of a different class than the gun that fired the Item 1 known bullets as well as the Item 2, 3, and 5 questioned bullets.

Results from One Laboratory:

- Two AFTE-certified examiners from the host laboratory performed the preliminary review and the verification of 10% of each batch produced during active production. They commented that there were sufficient markings for conclusions. However, the test would be more challenging and may take examiners longer to review based on the similarity of class characteristics and the presence of finer-striated patterns located in the land and groove surfaces.

Consensus Value from Expert Laboratories:

- After final construction of the test sets, CTS sends out three sets for preliminary analysis and evaluation (predistribution).
- For Test 23-5262, all three predistribution participants reported inconclusive for Items 2 and 3 and eliminated Item 4. Two labs reported inconclusive for Item 5, and one lab eliminated Item 5.
- The predistribution participants had the following comments.
    - Two of the three felt it was a practical test, with the third unsure about the practicability due to the increased difficulty level.
    - Two of the three felt the quality of the samples met lab's standards for testing, with the third not responding. One did state it was the most difficult PT they have ever received, but was more similar to casework and stated that there could be an increase in inconclusive results.
    - One stated that there was limited reproduction of individual characteristics within the known Item 1 bullets, making the identification within the known bullets challenging.

Consensus Value from Participant Results:

- Within the firearms discipline, an inconclusive result is grouped with the elimination results, due to the common policy of not eliminating when class characteristics match or when examiners do not have access to the firearm.
- CTS has consistently included inconclusive results with elimination results within our discussion of consensus determinations; most of the time, the inconclusive portion is quite small in comparison. For example, within the last five years, there have been three other bullet tests with elimination items from firearms with similar class characteristics, with inconclusive rates of 8%, 14%, and 7%.
- For Test 23-5262, the number of inconclusive responses outweighed the elimination responses (47% vs. 31%), but was not unexpected based on the results from the predistribution evaluation.

CTS considered all four of these methods when determining the assigned value. Our formulation, and production laboratory confirmed the elimination responses, and the predistribution and a large population of the responding participants confirmed the inconclusive responses. Therefore, CTS decided to continue with our long-standing policy of including inconclusive results with elimination results when determining the assigned value and the overall consensus value of 78.2% (220 of 280).

To assist laboratories with their performance evaluation, CTS made the decision to emphasize that both responses were part of the assigned value for the 23-5262 Firearms Examination test.

What are the results for only accredited participants?

The chart below represents only those participants who released their data to either of the two accrediting bodies that CTS gathers and submits information to, ANAB and A2LA. It does not represent the participants who are accredited by agencies outside of ANAB or A2LA or participants who are accredited to ANAB or A2LA but chose not to submit their results through CTS, nor does it represent the experience, training, or competency of the participants.

191 participants released data to either ANAB or A2LA for Test 23-5262.

Total Reporting Assigned Values (Combined Elimination and Inconclusive Results)	**Reported Elimination for All Items**	**Reported Inconclusive for Items 2, 3, and 5 and Elimination for Item 4**	**Reported Elimination for Item 4, and an Identification of Any Other Items**
175 (91.6%)	63 (33.0%)	111 (58.1%)	16 (8.4%)

Did CTS have an increased rate of participants not returning data for Test 23-5262?

The non-response rate for Test 23-5262 was higher than other firearms tests over the past five years. This is not a significant variance from previous tests, especially when compared against other tests conducted in the second half of the year, as these tests tend to have a higher non-response rate. Each test's non-response rate is detailed in the table below, with the second half tests highlighted.

Year	**Test ID**	**Non-Response Rate**	**Material Type**
2023	23-5262	24%	Bullets
2023	23-5261	14%	Cartridges
2022	22-5262	17%	Cartridges
2022	22-5261	15%	Bullets
2021	21-5262	20%	Bullets
2021	21-5261	11%	Cartridges
2020	20-5262	18%	Cartridges
2020	20-5261	13%	Bullets
2019	19-527	23%	Bullets
2019	19-526	14%	Cartridges
2018	18-527	20%	Cartridges
2018	18-526	12%	Bullets

What action is CTS taking to ensure that future tests meet industry needs and customer expectations?

After a thorough review of our processes, we affirm that CTS Firearms Examination Test 23-5262 was valid and that all quality measures were implemented properly; however, in response to customer feedback and to better meet the needs of the firearms community, we are implementing the following improvements to the production of our firearms testing.

- We are increasing data collection and documentation during the preliminary stages of choosing the firearm and ammunition and during verification of production batches, with a focus on tracking consistency, reproducibility, and quality.
- We are also increasing our rejection criteria during production to provide more consistent and high-quality materials.
- We are strengthening predistribution evaluation by requesting more information from participants. Additionally, during the review of predistribution results, CTS will follow our in-depth procedures of investigation for inconclusive responses on elimination items.