



Commonwealth of Virginia
DEPARTMENT OF FORENSIC SCIENCE

ORIGINAL

CERTIFICATE OF ANALYSIS

Central Laboratory
700 N. 5th Street
Richmond, VA 23219

October 24, 2017

Tel. No.: (804) 786-4707
Fax: (804) 786-6907

TO: JEREMY CARPER
CHARLOTTESVILLE POLICE DEPARTMENT
606 EAST MARKET STREET
CHARLOTTESVILLE, VA 22902

FS Lab # C17-9729

Your Case #: C2017-27665

Victim(s): HEYER, Heather Danielle

Suspect(s): FIELDS, James Alex, Jr.

Evidence Submitted By: Diana Hueschen

Date Received: 09/13/2017

Item 25 Swabs of material from the passenger side windshield of the Challenger
Item 58 Buccal swabs from Heather Heyer

BODY FLUID DETECTION METHODS:

- The indication of blood is based on physical characteristics innate, but not unique, to the body fluid tested. Therefore, the testing for blood is not confirmatory.
 - The indication of blood is conducted through visual and chemical examinations.

DNA ANALYSIS METHODS:

- The method of deoxyribonucleic acid (DNA) analysis used was the Polymerase Chain Reaction (PCR).
- The PCR amplification kit used was the PowerPlex® Fusion System.
- The PowerPlex® Fusion System allows co-amplification and four-color detection of 24 loci (D3S1358, D1S1656, D2S441, D10S1248, D13S317, D16S539, D18S51, D2S1338, CSF1PO, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, D22S1045, and FGA plus Penta E, Penta D, DYS391 and Amelogenin).
- Amelogenin and DYS391 aid in the determination of gender.

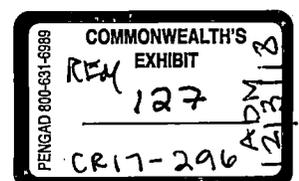
STATISTICAL ANALYSIS METHODS:

- The DNA statistics calculated herein used the 2017 revised population allele frequencies provided by the National Institute of Standards and Technology (NIST).
- The statistical calculation(s) have been performed in accordance with the Scientific Working Group on DNA Analysis Methods (SWGDM) 2017 Interpretation Guidelines and Departmental procedures.
- The D12S391, DYS391 and Amelogenin loci are not used for statistical purposes.

RESULTS:

Item 58 - Buccal swabs from Heather Heyer

- A DNA profile was developed.





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Item 25 - Swabs of material from the passenger side windshield of the Challenger

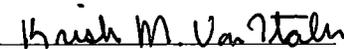
- Blood was indicated on a selected portion of the material on the swabs.
- A DNA profile was developed.
 - Heather Heyer cannot be eliminated as a contributor of this DNA profile.
 - The probability of randomly selecting an unrelated individual with a DNA profile matching that developed from the swabs of material from the passenger side windshield at the PowerPlex® Fusion loci is 1 in greater than 7.2 billion (which is approximately the world population) in the Caucasian, African American, and Hispanic populations.

Refer to Appendix 1 for the DNA Typing Results and Appendix 2 for the Abbreviations.

Supporting examination documentation is maintained in the case file. The evidence is being retained for personal pickup.

Attest:

I certify that I performed the above analysis or examination as an employee of the Department of Forensic Science and that the above is an accurate record of the results and interpretations of that analysis or examination.


Kristin M. Van Itallie
Forensic Scientist

KVI




COMMONWEALTH of VIRGINIA
DEPARTMENT OF FORENSIC SCIENCE

Appendix 1: Table of Typing Results

FS Lab#:C17-9729

October 24, 2017

Item:	Item 25: Windshield	Item 58: H. Heyer
AMEL	X	X
D3S1358	17	17
D1S1656	12, 17.3	12, 17.3
D2S441	11, 14	11, 14
D10S1248	13	13
D13S317	10, 11	10, 11
Penta E	11, 13	11, 13
D16S539	11, 12	11, 12
D18S51	12, 14	12, 14
D2S1338	16, 17	16, 17
CSF1PO	10	10
Penta D	11, 13	11, 13
TH01	9	9
vWA	14, 17	14, 17
D21S11	30, 31	30, 31
D7S820	8, 10	8, 10
D5S818	11	11
TPOX	8, 11	8, 11
DYS391	---	---
D8S1179	11, 15	11, 15
D12S391	21, 24	21, 24
D19S433	13, 14	13, 14
FGA	24, 26	24, 26
D22S1045	11, 16	11, 16

INC, indicates no conclusive types detected

---, indicates no type detected

NT, indicates locus not tested



COMMONWEALTH of VIRGINIA
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Appendix 2: Abbreviations

FS Lab#:C17-9729

October 24, 2017

ANO	Anorectal sample
BLD	Blood stain
ELIM	Elimination
ENV	Envelope
FNC	Finger Nail Clippings
FNS	Finger Nail Scrapings
K	Known
L	Left
LLA	Lips/Lip Area sample
MAT	Material
NSP	Non-sperm fraction
OR	Oral Rinse sample
PA	Pubic Area sample
PB	Perianal/Buttocks sample
PH	Pubic Hair
Q	Questioned
R	Right
SC	Stain Card
SMPL	Sample
SP	Sperm fraction
STN	Stain
STN'D	Stained
SUS	Suspect
SWB	Swab
TEG	Thighs/External Genitalia sample
UPS	Underpants
VC	Vaginal/Cervical sample
VIC	Victim



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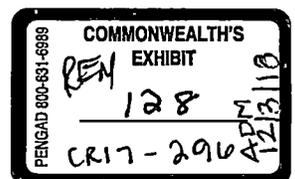
- Item 4 Swabs of red stain from concrete manhole drain
- Item 6 Swabs of red stain from roadway
- Item 7 Swabs of red stain from pole #6351
- Item 8 Swabs of red stain from roadway
- Item 14 Swabs of red stain from windshield of Camry
- Item 20 Swabs of red stain from passenger side bottom of A-pillar on Challenger
- Item 23 Swabs of unknown stain from passenger side of A-pillar area of Challenger
- Item 24 Swabs of red stain from passenger side A-pillar area on Challenger
- Item 35 Swabs of red stain from passenger side of trunk on Challenger
- Item 52 Swabs of red stain from grill recovered from the roadway
- Item 63 Swabs of brown stains from top of gray passenger side mirror of Challenger

BODY FLUID DETECTION METHODS:

- The indication of blood is based on physical characteristics innate, but not unique, to the body fluid tested. Therefore, the testing for blood is not confirmatory.
 - The indication of blood is conducted through visual and/or chemical examinations.

DNA ANALYSIS METHODS:

- The method of deoxyribonucleic acid (DNA) analysis used is the Polymerase Chain Reaction (PCR).
- The real-time PCR amplification kit used for DNA quantitation was the Plexor[®] HY System.
 - The Plexor[®] HY System quantitates both total human DNA and male DNA.
- The PCR amplification kit used for DNA typing was the PowerPlex[®] Fusion System.
 - The PowerPlex[®] Fusion System allows co-amplification and four-color detection of 24 loci (D3S1358, D1S1656, D2S441, D10S1248, D13S317, D16S539, D18S51, D2S1338, CSF1PO, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, D22S1045, and FGA plus Penta E, Penta D, DYS391 and Amelogenin).
 - Amelogenin and DYS391 aid in the determination of gender.





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October 9, 2018

STATISTICAL ANALYSIS METHODS:

- The DNA statistics calculated herein used the 2017 revised population allele frequencies provided by the National Institute of Standards and Technology (NIST).
- The statistical calculation(s) have been performed in accordance with the Scientific Working Group on DNA Analysis Methods (SWGDM) 2017 Interpretation Guidelines and Departmental procedures.
- The D12S391, DYS391 and Amelogenin loci are not used for statistical purposes.

RESULTS:

Item 4 - Swabs of red stain from concrete manhole drain

Item 6 - Swabs of red stain from roadway

Item 7 - Swabs of red stain from pole #6351

Item 8 - Swabs of red stain from roadway

Item 14 - Swabs of red stain from windshield of Camry

Item 20 - Swabs of red stain from passenger side bottom of A-pillar on Challenger

Item 23 - Swabs of unknown stain from passenger side of A-pillar area of Challenger

Item 24 - Swabs of red stain from passenger side A-pillar area on Challenger

Item 35 - Swabs of red stain from passenger side of trunk on Challenger

Item 52 - Swabs of red stain from grill recovered from the roadway

Item 63 - Swabs of brown stains from top of gray passenger side mirror of Challenger

- Blood was indicated on each set of swabs.
- A DNA profile was developed from each set of swabs.
 - Of these eleven profiles, ten different profiles, indicative of nine different contributors were developed.
 - Heather Heyer (Item 58, previously reported in the Certificate of Analysis dated October 24, 2017) cannot be eliminated as a contributor of the DNA profiles developed from the swabs of unknown stain from passenger side of A-pillar area of Challenger (Item 23) and the swabs of red stain from passenger side A-pillar area on Challenger (Item 24).
 - The probability of randomly selecting an unrelated individual who would be included as a contributor of the profile developed from the swabs of unknown stain from passenger side of A-pillar area of Challenger (Item 23) at the PowerPlex® Fusion loci, with the exception of D13S317, D21S11, D5S818, TPOX, and D22S1045, is 1 in greater than 7.2 billion (which is approximately the world population) in the Caucasian, African American, and Hispanic populations.
 - The probability of randomly selecting an unrelated individual with a DNA profile matching that developed from the swabs of red stain from passenger side A-pillar area on Challenger (Item 24) at the PowerPlex® Fusion loci is 1 in greater than 7.2 billion (which is approximately the world population) in the Caucasian, African American, and Hispanic populations.
 - Heather Heyer is eliminated as a contributor of the remaining DNA profiles from Items 4, 6, 7, 8, 14, 20, 35, 52, and 63.
 - Additional DNA comparisons can be conducted following the submission of two buccal (cheek) swabs from any persons of interest to the Laboratory.

Refer to Appendix 1 for the DNA typing results and Appendix 2 for the Abbreviations.

Supporting examination documentation is maintained in the case file. The above listed methods are those approved for use at the time of analysis. Current methods can be found in the Forensic Biology Procedures Manuals, which can be found at www.dfs.virginia.gov/documentation-publications/manuals/.



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Kristin M. Van Itallie
Kristin M. Van Itallie
Forensic Scientist

KVI

BoV



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Appendix 1: Table of Typing Results

FS Lab#:C17-9729

October 9, 2018

Item:	23: A-pillar	24: A-pillar
AMEL	X	X
D3S1358	17	17
D1S1656	12, 17.3	12, 17.3
D2S441	11, 14	11, 14
D10S1248	13	13
D13S317	---	10, 11
Penta E	11, 13	11, 13
D16S539	11, 12	11, 12
D18S51	12, 14	12, 14
D2S1338	16, 17	16, 17
CSF1PO	10	10
Penta D	13	11, 13
TH01	9	9
vWA	14, 17	14, 17
D21S11	30	30, 31
D7S820	8, 10	8, 10
D5S818	---	11
TPOX	---	8, 11
DYS391	---	---
D8S1179	11, 15	11, 15
D12S391	21, 24	21, 24
D19S433	13, 14	13, 14
FGA	24, 26	24, 26
D22S1045	---	11, 16

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ANO	Anorectal sample
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ENV	Envelope
FNC	Finger Nail Clippings
FNS	Finger Nail Scrapings
K	Known
L	Left
LLA	Lips/Lip Area sample
MAT	Material
NSP	Non-sperm fraction
OR	Oral Rinse sample
PA	Pubic Area sample
PB	Perianal/Buttocks sample
PH	Pubic Hair
Q	Questioned
R	Right
SC	Stain Card
SMPL	Sample
SP	Sperm fraction
STN	Stain
STN'D	Stained
SUS	Suspect
SWB	Swab
TEG	Thighs/External Genitalia sample
UPS	Underpants
VC	Vaginal/Cervical sample
VIC	Victim