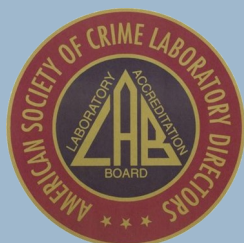




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The Lab Report

Volume 2, Issue 3

October 2012

In This Issue....

Scientific technology in the forensic science disciplines is ever-evolving. The advent of new technologies pertaining to differing forensic fields is making it possible for analysts to perform examinations that were virtually unthinkable in past years! The media is full of examples of evidence from cases, long assumed cold, being submitted to crime labs across the country to have analysis performed that was not available at the time the crime was committed. These cases have resulted in either the exoneration of an innocent person convicted of a crime they did not commit or the conviction of an offender who had been free. In this issue, the topic of how the laboratory can assist in cold case investigations will be discussed.

Additional topics included in this issue of The Lab Report include: a recap of the recent Crime Lab Road Show Training, a briefing on a new type of ammunition that may be encountered on crime scenes, and the use of the new Biology Supplemental Evidence Form (750A).

If you have any questions/concerns regarding the topics related to this issue (or any other issue) of The Lab Report, please do not hesitate to contact us (laboratory staff contact information - pg. 10).

Enjoy!

Amy Weber (Firearm/Tool Mark Section Analyst - editor, The Lab Report)

The Backlog Corner

Biology Unit: 192 assignments (approx. 6 month turnaround time)

Physical Sciences Unit:

Firearm/Toolmark cases: 63 assignments (approx. 8 month turnaround time)

NIBIN: 117 assignments (approx. 10 month turnaround time)

Latent Fingerprints Section: 43 assignments (approx. 3 week turnaround time)

Chemistry Unit:

Controlled Substances: 673 assignments (approx. 3 month turnaround time)

Toxicology: 53 assignments (approx. 2 month turnaround time)

Trace: 7 assignments (approx. 1 month turnaround time)

**Footwear/Tire****Analysts**

Kent Weber (Sup.)

Amy Weber

Sarah Zarnick

DNA Analysts

Jason Linder (Mgr.)

Katie Rector (CODIS)

Melissa Kreikemeier

Christel Davis

Brandy Porter

Heidi Young

Hillary Duin (lab tech)



2012 NSP Crime Lab Road Show: Recap and Survey

The NSP Crime Lab has completed its first official Road Show Training! The training was offered **free of charge** to all attending law enforcement/judicial system agencies. **The training was approved by the Nebraska Crime Commission as qualifying for 5 Continuing Legal Education (CLE) points.** Training topics included:

Footwear/Tire Impression Evidence - Myths, misconceptions, and best practices for footwear/tire impression evidence collection (lecture and in-depth hands-on demonstrations of collection techniques).

“Touch” DNA - “Touch” DNA considerations (pros/cons) and how to properly submit biological evidence to the crime lab via the newly implemented “tiered” approach to DNA evidence. Also discussed was the proper use of the DNA supplemental evidence submittal form (750A).

The training was offered in six locations across the state of Nebraska (Lincoln, Omaha, Norfolk, North Platte, Grand Island, and Scottsbluff). In attendance were **123** law enforcement officers and criminal justice representatives representing **54** different local, state, and federal agencies!

Through this form of educational outreach, we have received an overwhelming amount of positive feedback from the training attendees! The NSP Crime Lab would like to continue offering free training across the state, but needs **YOUR** feedback as submitting agencies!

The below link will take you to a brief, one question survey with which you will be able to choose what training topics you would like to see offered by the crime lab for 2013. Please take a moment to click on the link and fill out the survey. The results will be confidential and the final tally will assist in the development for future training provided by the lab!

<http://www.surveymonkey.com/s/HDV2N6J>

Thank you to all who were able to attend the NSP Crime Lab 2012 Road Show Training! We are committed to providing quality laboratory services as well as educational outreach for all of the submitting agencies in Nebraska!

If you have additional questions with regard to free individual agency training courses, please contact:

NSP Lab Director Pam Zilly - 402-471-8950 or Pam.Zilly@nebraska.gov

What's New in Ammunition? Crime Scene & Lab Considerations

Winchester Elite Dual Bond Bullets

Ammunition manufacturers routinely develop new types of firearm ammunition. It is imperative that firearm analysts as well as crime scene investigators remain educated on newly developed ammunition designs as it could impact analysis.

Winchester has produced a new bullet/sabot line of ammunition called Elite Dual Bond. Marketed as a “bullet within a bullet”, it is produced in a variety of large caliber handgun cartridges (44 Remington Magnum, 454 Casull, 460 Smith & Wesson Magnum, and 500 Smith & Wesson Magnum) as well as 12 gauge and 20 gauge sabot shotgun slugs (see below manufacturer’s links).

<http://www.winchester.com/Products/handgun-ammunition/Innovative/dual-bond-handgun/Pages/default.aspx>

<http://www.winchester.com/PRODUCTS/SHOTSHELL-AMMUNITION/Innovative/Dual-Bond-Shotshell/Pages/default.aspx>

There are several things to take into consideration if this type of ammunition is encountered either on a crime scene or in a laboratory setting. The bullet is designed to have a jacket inside of the primary jacket. The inner jacket is un-plated brass and is bonded to the lead core. Both jackets possess sharp “talons” on the nose. The unfired bullet externally looks like a typical jacketed hollow point bullet, however behaves differently when fired.

Below is an example of a 240 grain, 44 Magnum caliber Winchester Dual Bond bullet that was fired into a water tank.

Side view



Top view



The impact caused the outer jacket to peel off of the inner “bullet”. The inner bullet displayed extreme expansion with the core still firmly bonded to this jacket. The inner jacket diameter was different from the outer jacket, weighed 168.5 grains, and displayed no rifling impressions from which to perform a firearm comparison. The inner jacket material is more pliable than the heavier outer jacket material.

This type of evidence could be extremely confusing when encountered on a crime scene and could have laboratory implications on the case if BOTH jackets are not submitted to the lab for analysis.

If this type of evidence presents itself at a crime scene, please submit ALL of the fired evidence as well as any UNFIRED ammunition located with the suspect or on scene to the laboratory. This will allow section analysts to better evaluate ammunition design characteristics between unfired and fired ammunition components in addition to the firearm characteristics imparted on the fired bullets.



Firearm/Toolmark

Section

Kent Weber (Sup.)

Amy Weber

Sarah Zarnick





Biology Unit

Jason Linder (Mgr.)

Katie Rector (CODIS)

Melissa Kreikemeier

Christel Davis

Brandy Porter

Heidi Young

Hillary Duin (lab tech)



New Submittal Form - Biology Supplemental Form 750A

NSP Policy 83-2 went into effect on September 23, 2011 (revision) in which the Biology Unit started utilizing a tiered approach to evidence analysis. In order to do this, the Biology Supplemental Form (750A) was put into effect. When submitting biology evidence, the routine NSP evidence submittal form (750) must be filled out in its entirety (see below link).

http://www.statepatrol.nebraska.gov/media/11180/nsp_750_evidence_submittal_form.pdf

In addition, the new Biology Supplemental Form (750A) (see below link for form) is to be used solely for Biology requests. This form asks for additional information that is not required on the main 750 form. The 750A supplemental form is intended for evidence only - not reference samples or controls.

http://www.statepatrol.nebraska.gov/media/11183/nsp_750a_supplemental_submission.pdf

Things to note on the new Biology Supplemental Form (750A):

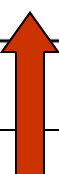
⇒ **Header:** similar to the general evidence submission form (750) with the addition of a field denoting the prosecuting attorney (if known).

*Please list the item(s) in order of priority based on their probative value pertaining to the case (1= most probative). Please only list the evidence submitted to the laboratory and not any reference samples. By informing us which items are the most probative to the case, analysis can be performed in a timelier manner to provide you with more useful results. We appreciate your cooperation in providing us with information regarding the probative nature of evidence that you have submitted to the laboratory. Examination(s) and/or item prioritization may be subject to change based on facts of the case and analysis of items. Please attach any additional pages if needed.

THE FOLLOWING INFORMATION IS NOT NEEDED IF PROVIDED FOR ON THE NSP 750		
Investigating Agency: _____	Agency Case #: _____	
Investigating Officer: _____	Phone: _____	Email: _____
Supervisor Contact: _____	Phone: _____	Email: _____
Prosecuting Attorney (if known): _____	Phone: _____	Email: _____

⇒ **Inventory:** List evidence items individually and fill out all relevant information. Note that bags of swabs or clothing are NOT one item - every item in a bag must be listed separately!

INVENTORY OF EVIDENCE SUBMITTED			
Description (In order of priority)*	Where was the item collected?	Who does the item belong to?	Examination(s) Requested (Examinations must be probative to the case)
1. One Hat	☐ Suspect's Property ☐ Victim's Property ☐ Other (please explain): _____	☐ Suspect ☐ Victim ☐ Other (please explain): _____	☐ Semen ☐ Touch ☐ Blood ☐ Urine ☐ Hair ☐ Saliva
How does item pertain to crime? Suspect hat found at the crime scene			
2. _____	☐ Suspect's Property ☐ Victim's Property ☐ Other (please explain): _____	☐ Suspect ☐ Victim ☐ Other (please explain): _____	☐ Semen ☐ Touch ☐ Blood ☐ Urine ☐ Hair ☐ Saliva



New Submittal Form - Biology Supplemental Form 750A

⇒ **Bottom Section:** Request for additional information (e.g. “Is it ok to consume sample(s)?” - you **MUST** select one of the options and INITIAL if it is ok to consume samples for analysis!

GENERAL QUESTIONS	
Is it okay to consume sample(s)?	☐ Yes, consume samples if needed. (Must provide your initials or signature): _____ ☐ Please contact me before consuming samples. (Must provide contact information above)
Have elimination samples been collected for this case (ex. Primary driver of the vehicle or occupant of residence)?	☐
Were there any individuals with injuries sustained from the crime that resulted in bleeding? Please list those individuals	☐

Must Have Initials!

If you have any questions/concerns with regard to the proper completion of the Biology/ DNA Supplemental Form (750A), please contact an analyst in the Biology Unit.

Cold Case Investigations and the Laboratory

Ever-evolving technology being implemented in crime laboratories across the country allows forensic scientists to better analyze and interpret evidence collected from crime scenes. As a result of this increase in technology (e.g. the advent of DNA analysis in the early 1990's and national databases such as CODIS, AFIS, and NIBIN), an increasing amount of cases assumed to be cold are being sent to crime laboratories in order for evidence to be analyzed using these new tools. Examination of evidence from cold cases (as in the case linked below) for DNA, entry into CODIS (DNA), AFIS (latent prints), and NIBIN (firearms) have resulted in cold cases being solved and the subsequent prosecution of suspected offenders.

<http://www.forensicmag.com/news/dna-evidence-helps-solve-37-year-old-cold-case>

The NSP Crime laboratory can receive evidence from cold cases for additional analysis using the technologies listed above that may not have been in existence when the cold case crime occurred. Additional analysis of evidence from cold cases might aid in developing case leads that may not have been evident when the case was originally investigated.

If you have a cold case in which you believe you have evidence that may qualify for DNA analysis, entry into one of the section databases, or general examination by a section, please contact the appropriate laboratory section. An analyst can help advise what examinations may be possible for your cold case.



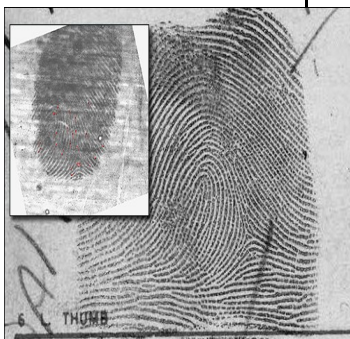


Latent Print Section

Mariana Ward (Sup.)

Steve Burke

Bridget Driver



Cold Case Investigations: Latent Prints

The 2012 Latent Hit of the Year Award was presented last month to two employees of the Omaha Police Department - Detective Douglas Herout and Senior Crime Laboratory Technician Laura Casey - for their efforts to identify the man responsible for a brutal murder that occurred over 30 years ago. (see below link for full story)

<http://www.fbi.gov/news/stories/2012/september/30-year-old-murder-solved/30-year-old-murder-solved>

This case is a great example of the vital role that emerging technology plays in solving cases once thought to be cold.

Cold Cases and Latent Prints

The term “cold case” usually refers to a case where all investigative leads have been exhausted. However, additional information could emerge from new witness testimony, re-examined archives, retained material evidence, as well as fresh activities of the suspect.

The majority of cold cases are violent in nature – making them felony crimes (i.e. murder, rape), and they do not have a statute of limitations. There are other cases where the crime becomes known long after it occurred, usually with discovery of remains. Other cases occur in which the case was ruled an accident or a suicide, and it is only after the discovery of additional evidence that the case is re-classified as a homicide and re-opened.

In recent years, the use of various new technologies has uncovered new leads for investigators and has provided justice for victims. New technology that is used in the NSP Crime Laboratory Latent Print Section includes:

- ⇒ **Digital Photography** - replaced outdated MP4 Polaroid camera
- ⇒ **Adobe Photoshop CS2 software** - allows digital processing of captured latent impressions with application of tools mirroring the effects of those traditionally used in dark rooms
- ⇒ **RUVIS (Reflective Ultra Violet Imaging System)** - allows visualization of latent impressions on smooth, non-porous items without application of any chemicals or dyes
- ⇒ **Nebraska AFIS palm print database** - implemented in 2007
- ⇒ **Expanded fingerprint database** (new fingerprint records are added daily)
- ⇒ **IAFIS capabilities** - presently it only accepts fingerprint submission to the FBI database, no palm print search capabilities at this time.

Cold Case Investigations: Latent Prints

If your agency has a cold case on file, and would like to re-open it, the following are types of evidence that the NSP Latent Print Section will accept:

- ⇒ Latent lifts
- ⇒ Latent photographs – Polaroid or digital must include a scale within the image
- ⇒ Items not previously processed for friction ridge detail.

In instances where the items in the cold case have been **previously processed** for latent activity, please contact the latent print section **prior to** submitting it to the crime lab, and an analyst will evaluate the feasibility of latent re-processing on a case-to-case basis.

Additional information that will need to be provided (listed on NSP750) about your case:

- ⇒ Full names (and aliases, if available) of anyone in contact with the evidence, to include victim(s), suspect(s), officer(s), elimination(s), etc.
- ⇒ Date of birth of any person listed
- ⇒ Nebraska State ID# or FBI#, if known
- ⇒ Your agency's case number
- ⇒ Latent case number, or NSP Crime Lab case number that was previously assigned to your case, if this is not first submission to the NSP Crime Lab

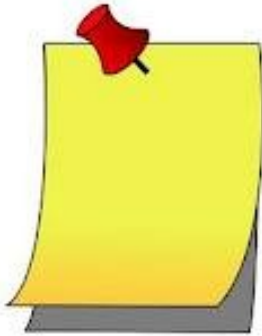
Please note that if you are submitting known impressions for comparison, in order for us to enter palm prints into the Nebraska AFIS database, you must submit both fingerprints and palm prints of an individual at the same time.

The NSP Latent Print Section will on a regular basis accept cold cases involving homicide, suicide, forgery, arson, sexual assault/rape cases.

The NSP Latent Print Section will NOT accept cases where statute of limitation has expired, unless it involves crime against person (i.e.: stalking, robbery, gun offenses, terroristic threats, assault, and child abuse).

Prior to submitting any cold case evidence, you must contact the NSP Crime Lab, speak with the appropriate section personnel, and obtain an approval for evidence re-submission!





Helpful Hints: Packaging Controlled Substances

Many submitting agencies use heat-sealed plastic bags and/or manufactured plastic evidence bags for the packaging of evidence. While the use of these types of packaging is not discouraged, there are some important considerations to keep in mind:

- ⇒ **Heat seals on plastic bags** - Ensure, when heat-sealing, that the seal extends the entire length and/or width of the plastic bag. If the seal is not complete, there is the potential for the bag to open. It is also important to set your heat sealer to the appropriate manufacturer-recommended heat setting for sealing. If your heat sealer is set at too low a temperature, the seal may **look** complete but is, in actuality, not sealed. Conversely, if your heat sealer is set at too high a temperature, the plastic seal will melt, leaving holes in the seal. **If you are unsure of your seal integrity, test it - if you can open the seal, it is improper and needs to be resealed!**



Proper Heat Seal



Improper Heat Seal

Evidence Section

Jan Johnson (Sup.)

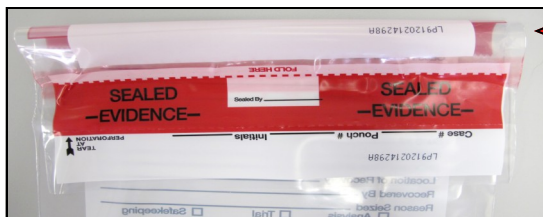
Margaret Wiesen

- ⇒ **Manufactured “self-sealing” plastic evidence bags** - Many forensic supply companies sell manufactured “self-sealing” plastic evidence bags. These types of bags are marketed for ease of use for the collecting officer (e.g. “self-sealing”, printed labels, variety of sizes). However, one must also take precautions to ensure the integrity of the seal with this form of packaging as well!

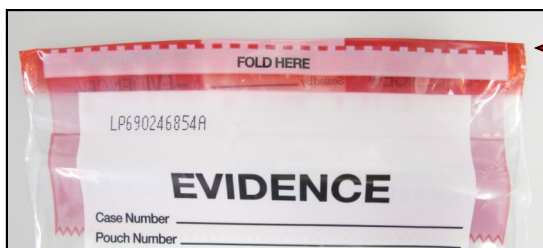


- ⇒ These types of bags are open at one end with an adhesive seal along the open end. Typically, there is a dotted line or other designations directing the person packaging items where to fold and seal the opening. **It is possible to improperly seal this type of packaging.** An example of an improper seal includes failure to fold the seal on the designated area on the bag - folding below the designated area will result in a bag in which one can still access the interior of the bag; folding above the designated area will result in a bag in which the opening can easily be accessed through handling.

Helpful Hints: Packaging Controlled Substances (continued)



Bag sealed below the designated fold area results in a gap/opening in the bag whereby evidence integrity can be compromised (through handling or otherwise)



Properly sealed bag. Fold is along the designated area resulting in a fully, sealed evidence bag.

If you have any questions/concerns with regard to proper use of heat sealed plastic bags or manufacturer “self-seal” evidence bags, do not hesitate to call the NSP Crime Lab Evidence Section!

Spotlight on Forensics - Meggan Macomber (Chemistry Unit)



Name: Meggan L. Macomber

Hometown: Caledonia, MN

Education: B.A. Chemistry (Cornell College)

M.S. Forensic Science (Marshall University)

Work Experience:

Marshall University Forensic Chemistry Lab (Graduate/Teaching Assistant) - Huntington, WV (August 2009-May 2011)

Minnesota Bureau of Criminal Apprehension Crime Lab (Intern - Arson) - St. Paul, MN (June –August 2010)

NSP Crime Lab (Forensic Scientist - Controlled Substances) - Lincoln, NE (August 2011-present)

Hobbies: I enjoy reading, writing, hanging out with friends and family, playing card/board games, watching movies, and being involved in activities at church. I love music, but the only instruments I play are handbells. Oh, and I also sing. A lot. And usually off-key....

Contact Information: Email: Meggan.Macomber@nebraska.gov Phone: 402-471-8976





Laboratory Director:
Pam Zilly

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Monday-Friday
8am—5pm

Evidence Receipt Hours:
Monday-Friday
9am-4pm

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