

# MINNESOTA DEPARTMENT OF PUBLIC SAFETY

Bureau of Criminal Apprehension Forensic Science Service



Saint Paul Laboratory



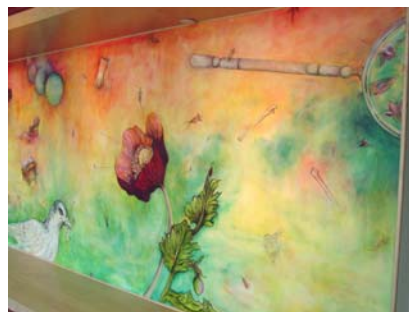
Bemidji Laboratory

## 2008 ANNUAL REPORT

# MINNESOTA BCA FORENSIC SCIENCE SERVICE 2008 ANNUAL REPORT

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## Message from Frank C. Dolejsi, Director

### 🕒 **Forensic Science Service Mission, Vision and Values**

**Mission Statement:** “The BCA Forensic Science Service provides quality forensic science services for the Criminal Justice community and fosters partnerships that promote research, education, and overall forensic science laboratory improvement.”

**Vision:** “*Seeking truth through science.*”

**Values:** “Espouse *Science is Neutral*”, “Honesty and Integrity”, “Laboratory Excellence”, “Accountability.”

### 🕒 **Quality:**

Our commitment to quality is demonstrated through our Quality Assurance Program. The laboratory system quality manager is Debra Springer; she can be contacted at 651-793-2895 or [debra.a.springer@state.mn.us](mailto:debra.a.springer@state.mn.us). Both the Saint Paul and Bemidji Laboratories are accredited under the American Society of Crime Laboratory Directors/ Laboratory Accreditation Board (ASCLD/LAB) Legacy Program. Visit: <http://www.asclld-lab.org/> for more information.

### 🕒 **Turn around time:**

Our stated goal is a 30 day turn around time on all cases. Priority is given to homicides, sexual assaults, and other crimes against persons. The average turn around time doesn't tell the entire story. For example over 82% of alcohol cases are completed in two weeks. With DNA cases, 7% are completed in less than 7 days, with 32% completed in less than 30 days. *The bottom line is that we do work with our clients in high profile cases to meet their special needs.*

### 🕒 **Outputs:**

The BCA Forensic Science Laboratories examined over 15,000 cases in Saint Paul and 1,300 cases in Bemidji during 2008. The crime scene team processed 63 crime scenes related to homicides and officer involved shootings.

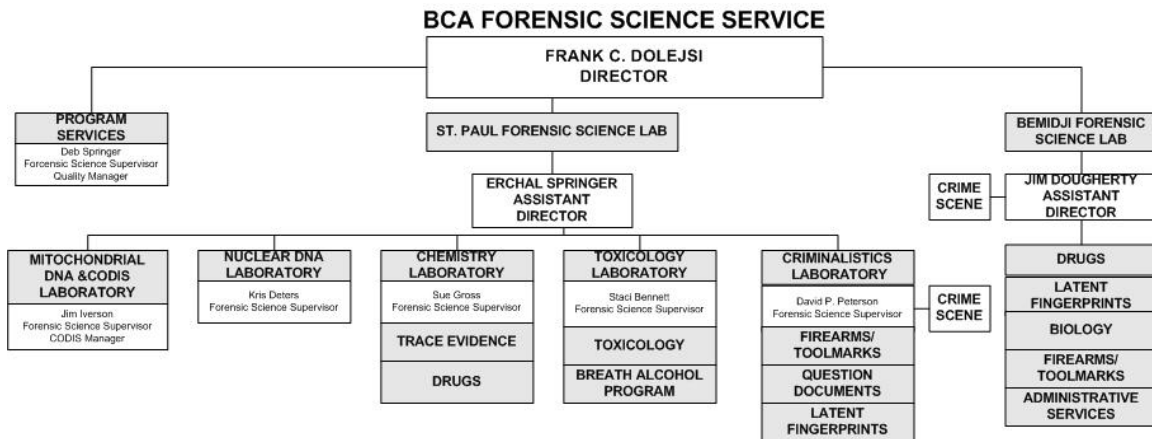
### 🕒 **Outcomes:**

There were 388 investigations aided through the Combined DNA Index System (CODIS), a database of convicted felons.

### 🕒 **Professional:**

Along with an outstanding staff of scientists at the BCA, we strive to improve not only our laboratory but our profession. In 2008, I served as Chair of ASCLD/LAB (a crime laboratory accreditation body) and served on the Board of the American Society of Crime Laboratory Directors (ASCLD). Ann Gross and Cathy Knutson serve on the Scientific Working Group of DNA Analysis Methods (SWGDM). Susan Gross serves on Scientific Working Group on Materials Analysis (SWGMA). Glenn Langenburg serves on Scientific Working Group on Friction Ridge Analysis, Study, and Technology (SWGFAST). Terry Laber serves on Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN). These scientific working groups set technical guidelines related to their scientific specialties. Jim Iverson serves on the Combined DNA Index System (CODIS) FBI advisory group. Ann Gross serves on the Board of the American Board of Criminalistics (ABC), a forensic scientist certifying body. Susan Gross is on the Board of the Midwestern Association of Forensic Scientists (MAFS) and serves as the newsletter editor of this professional scientific organization. Patrick Warrick is the Minnesota regional representative to the International Association of Identification (IAI). Jim Dougherty serves on the Crime Scene Proficiency Review Committee (PRC) of ASCLD/LAB. Ann Gross serves on the Biology (DNA) PRC.

## 🕒 Organization and Contacts:



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## 🕒 Case Statistics:

CASES RECEIVED	2001	2002	2003	2004	2005	2006	2007	2008
Homicide and Attempted Homicide	95	103	71	107	115	86	197	258
Death Investigation	156	188	180	182	170	196	204	247
Controlled Substance	3,441	3,326	3,432	3,905	4,295	3,823	3,494	2,903
Criminal Sexual Conduct	551	689	718	695	735	731	989	906
Burglary/Robbery	337	455	612	570	776	925	956	1042
Fire Investigations	132	178	159	164	151	230	234	220
Fraud/Forgery	78	87	94	84	96	63	39	48
DWI	5,633	5,200	5,168	5,029	5,257	5,220	5,304	8,899
All Other Criminal	1,365	1,553	1,565	1,747	2,293	2,374	2,297	2,036
Proficiency Testing	80	77	80	81	79	86	123	118
<b>TOTALS</b>	<b>11,868</b>	<b>11,856</b>	<b>12,079</b>	<b>12,564</b>	<b>13,967</b>	<b>13,734</b>	<b>13,837</b>	<b>16,677</b>

# Support Services

The primary focus of Support Services group is to provide the laboratory with assistance in day to day activities which affect all scientific sections of the laboratories in St. Paul and Bemidji. The Support Services group includes: quality assurance, safety and training, laboratory information management systems (LIMS), evidence intake, office and administrative support, photo/imaging, and DNA offender sample intake and tracking.

## **Office and Administrative**

The Office Administrative Support team organizes and maintains Laboratory records and directs important information from phone messages and faxes. They provide support for the Forensic Scientists through making discovery packets and controlling case files. This is a key element in that many subpoenas and important messages are constantly transmitted to Laboratory personnel.

## **Evidence Intake**

The Laboratory Evidence Intake staff provides effective and consistent evidence intake coverage for the Laboratory. The Forensic Evidence Specialists input information through the Laboratory Information Management System (LIMS) and direct the evidence to the appropriate sections for analysis. The Forensic Evidence Specialists are the liaisons for the laboratory and law enforcement personnel and the important initial point of contact for the Forensic Scientists and Investigators.



*Forensic Evidence Specialist Julie Trebesch*



## **Quality Assurance**

The Minnesota BCA Forensic Science Service prides itself on being of the highest quality possible to meet the needs of the criminal justice community. The Laboratory Quality Assurance programs are designed to provide a quality system to demonstrate that results are accurate, impartial and relevant. The Laboratory is designed to meet or exceed the requirements for laboratory accreditation established by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB). The Bemidji Laboratory and St. Paul Laboratory both maintain accreditations by ASCLD/LAB.

This year the Quality Assurance Team has completed the Quality System Manual International in preparation for the accrediting process by ASCLD/LAB International, this is a program that will accredit to the international ISO/IEC 17025 standards specific to forensic science.

## **Safety and Training**

The Safety and Training programs continue to focus on bio-hazardous wastes, chemical safety, respiratory protection, safety audits, court room testimony, crime scene, right to know, evidence handling and lab operations.

Other areas of involvement include:

Citizen's Academy – this academy educates business leaders in the community and shares the capabilities of the BCA to enhance community confidence.

Forensic Partnership Program – This program links Regional Coroner's offices with the BCA in an effort to educate death investigators throughout Minnesota. Death Investigators receive training from all aspects including crime scene, forensic analysis, and pathology.

Internship Coordination – The Laboratory was partner to five interns in 2008. They assisted in projects in the areas of biology, toxicology, chemistry and latent prints. The coordination of this program involves overseeing the entire application and interview process. See: <http://www.bca.state.mn.us/JobOpps/Documents/JobOp-Intro.html> information about application to the program.

## **Laboratory Information Management Systems (LIMS)**

The Laboratory computer evidence tracking system allows for quick and accurate organization of laboratory case information records. The secure system incorporates auto e-mailing to law enforcement agencies and access to report information by departments through access to the BCA lab report web-site at <https://BCALAB.dps.state.mn.us/BCALAB>

## **Photo Imaging**

The photography section accepts digital media submitted by BCA Agents, scientists and other agencies for investigation and court. Usually CD's and 8" x 12" index prints are supplied. Enlargements or prints are made as needed. DPS and BCA events are also photographed and processed.

## **DNA offender sample intake and tracking**

The Criminal Intelligence Analyst (CIA) receives DNA samples from all felony predatory arrestees. The CIA processes the samples and enters the information into the CODNA program as arrestee samples. If the arrestees are convicted of a felony predatory offense the samples are entered into the Convicted Offender DNA Index System (CODIS).

## **Purchasing and Inventory**

The laboratory has to evaluate supplies and purchase equipment to keep the laboratory operating efficiently and effectively. This section serves the laboratory by insuring that the legislatively mandated policies for purchasing are followed. This section also maintains and coordinates the inventory for all the analytical instrument and equipment used in the laboratory.

# **Biology**

## **Mitochondrial DNA Section**

The mitochondrial DNA (mtDNA) section had another successful year. The BCA Laboratory has the privilege of being a part of the FBI's Regional Mitochondrial DNA Program. In 2008, 125 cases were submitted through this cooperative agreement with the FBI. 36 of these cases were a part of a special FBI project. An additional 46 cases came from agencies all over the country. We also received cases from local law enforcement agencies within the state of Minnesota. Cases received consisted of the following: FBI Special Project – 36 cases, Missing Persons – 31 cases, Homicide – 20 cases, Death Investigation – 20 cases, Criminal Sexual Conduct – 5 cases, Assault – 1 case, Burglary – 1 case, Other – 1 case, and Proficiency Testing – 10 cases.





The section is currently working on 20 St. Paul cold case homicides that were submitted in 2008 as a part of the cold case funding that was received. We continued to work with Minneapolis on their cold case grant from 2007. We have unidentified profiles in nine Minneapolis cold cases and one St Louis County cold case. We had one offender hit to a Minneapolis cold case, and two cold cases from Minneapolis in which DNA profiles were obtained matching or not excluding the suspects in the cases.

A cooperative agreement between the BCA and Minneapolis in 2007 brought on two additional scientists. After completing their training they will be performing Serology and DNA testing on Minneapolis cases.

We began using the Tecan EVO robot for known samples. This automation has allowed us to ensure separation of samples as well as speed up the process. We are also working on the implementation of our new genetic analyzer, which will help to increase our turn around time.



*Tecan EVO robot*



*Hitachi 3130 Genetic Analyzer*

## **Offender DNA Database Section**

In 2008, the BCA Laboratory was able to assist 388 criminal investigations using information obtained from the Combined DNA Index System (CODIS). Throughout the past year, the Offender DNA Database Section has consistently been able to upload convicted offender DNA profiles to the National DNA Index System (NDIS) within 30 days of the date of receipt.

2008 marked the BCA Laboratory's validation of an automated procedure for extraction of DNA from convicted offender and casework reference samples using the Tecan Freedom EVO Robotic Workstation. This automated method has helped to streamline the processing of criminal cases as Offender group scientists can now profile the reference samples, allowing Nuclear DNA/Casework group scientists to focus on questioned evidence items.

In the past year, each scientist has also completed training in serological and/or casework DNA analysis, enabling them to provide assistance to the Nuclear DNA/Casework group in those areas, as well.

# Chemistry

## Chemical Testing

In 2008, the chemical testing section handled a total of 161 cases. The number of items per case remained steady at 2.8. Turn around time for the year has crept to approximately 45 days for fire debris samples.

This summer our intern was Joleen van Pelt from the University of Wisconsin in LaPlatte. Joleen completed this year's portion of a four year project on Solid Phase - Micro-Extraction (SPME). SPME is a solvent-less extraction technique. This would eliminate the use of solvents, such as carbon disulfide and pentane, which have health and environmental concerns. SPME could be used as a screening method, thus cutting down or eliminating solvent consumption in the laboratory. She worked comparison samples to verify that the carbon disulfide method agreed with the SPME method.

In March, we welcomed a new, experienced analyst to Chemical Testing. Kristin McDonald had been an analyst in Jamaica, New York laboratory and had experience in Fire Debris Analysis and Explosives Analysis. Her experience has brought a new dimension to the lab and she is a welcomed addition.

By the end of the year, Myha Le just about completed her training in Fire Debris Analysis and we are hoping she will be onboard shortly after the New Year. This has been a long, 13 month training session. She has shown herself to be an excellent analyst and a quick learner.

Kristin, Joleen and Dave participated in the Burn to Learn program in Fergus Falls this summer. We set 16 fires, dug them out and viewed video from each fire. Several departments around the State sent investigators, including the State Fire Marshal's Office. Jamie Novak coordinated the program. The results will be presented at the MNIAAI convention in St. Cloud in March of 2009. Also, the Burn to Learn program in Duluth in the fall will be included in that presentation. Nat Pearlson from Bemidji and Dave from the St. Paul laboratory set up demos and instruction in Crime Scene Processing and the collection and preservation of Fire Debris evidence.



*Fergus Fall's Burn to Learn – Before*

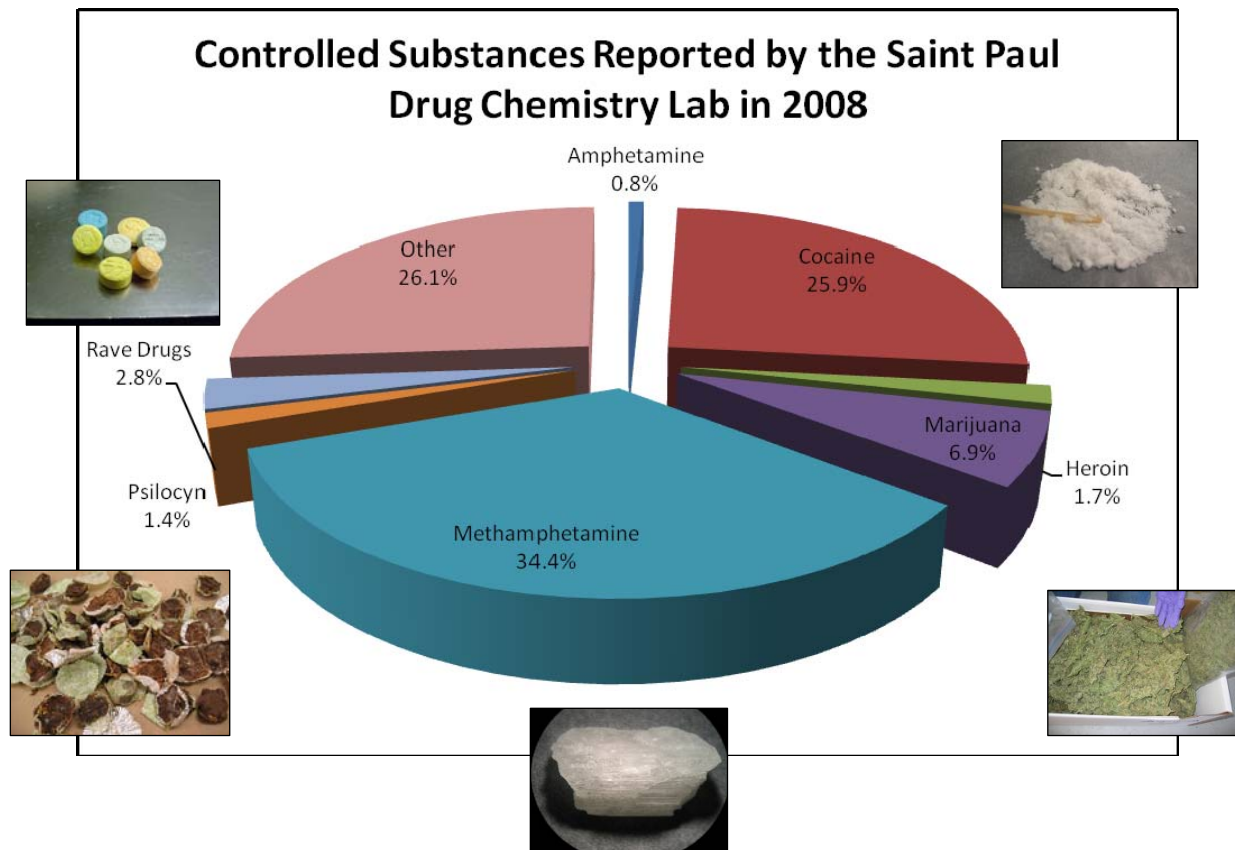


*Fergus Fall's Burn to Learn - After*

## Drug Chemistry

In 2008, the two newest members of the Saint Paul Drug Chemistry section completed their training and started casework. With that said, the Saint Paul Drug Chemistry section is composed of ten scientists; eight full-time, one sharing time with arson, and one seasonal scientist. The primary responsibility of the Drug Chemistry section is to analyze items of evidence for the presence of controlled substances. The items of evidence are usually submitted as powders, rock-like material, drug paraphernalia, plant material, tablets and/or capsules (clandestinely or legitimately manufactured), and liquids. The Saint Paul Drug Chemistry section received 2,202 cases in 2008 and reported out 2,437 cases.

Methamphetamine continued to be the most prominent controlled substance reported at the Saint Paul Drug Chemistry Laboratory. Of the 3,907 reported items, 1,345 items were reported as containing methamphetamine. Cocaine was the second most reported controlled substance with 1,014 items containing cocaine. The controlled substance with the largest reported weight in 2008 was marijuana. The 270 items reported as marijuana totaled 151.5 kilograms.



An increase in submissions of piperazine compounds has also been observed. N-Benzylpiperazine (BZP), a Central Nervous System stimulant, has appeared predominantly in clandestine tablets. In addition to the BZP, the clandestine tablets contain a myriad of other substances. The two most commonly seen are 3,4-MDMA (ecstasy) and 1-(3-trifluoromethylphenyl) piperazine (TFMPP). When BZP and TFMPP are taken in combination, they purportedly give psychomimetic effects similar to ecstasy. BZP is currently the only controlled piperazine. It is controlled at the federal level.



The Drug Chemistry section has three primary goals for 2009. The first will be to complete training and get the newest scientist online by August 2009. Once training is complete, the scientist will join the other two full-time drug chemists at the Bemidji lab. The second will be to keep the case backlog down and try to approach at least a 30 day turnaround time for both the Saint Paul and Bemidji laboratories. The third goal will be to utilize the recently validated High Performance Liquid Chromatograph (HPLC...*pictured to the left*) to perform analysis on various types of drugs. In particular, the HPLC will be used to determine the purity of methamphetamine for federal prosecutions. The HPLC

will allow for a quick and efficient method to quantitate methamphetamine. These goals represent the section's understanding of the significance of timely results for the investigation and prosecution of controlled substances. We are optimistic these goals will be achieved.

## Trace Evidence

The Trace Evidence Section makes comparisons to determine if there is a similarity between known and unknown samples of glass, paint, fibers, wood, soil, and other materials. Other examinations include the comparisons of shoeprints and tire tracks, as well as physical matches of broken or torn objects. Select individuals collaborate with the mtDNA laboratory by performing hair examinations. In 2008, the Trace Evidence Section received 166 microscopy cases, 9 of which were mito-trace (hair) cases. The Trace Evidence Section receives a wide variety of cases. Two interesting cases from 2008 follow.

The analysis of automotive paint in the Trace Evidence Section commonly involves comparative examinations between known and unknown exhibits. Occasionally, we are asked to analyze automotive paint chips of unknown origin to determine a make and model of a possible vehicle of origin. This can be extremely useful for investigative purposes especially in hit and run cases. The FBI in partnership with the RCMP (Royal Canadian Mounted Police) maintains an automotive paint searchable database commonly

referred to as PDQ (Paint Data Query). In addition, we annually collect samples to contribute to this database and maintain a small BCA library of automotive paint chips.

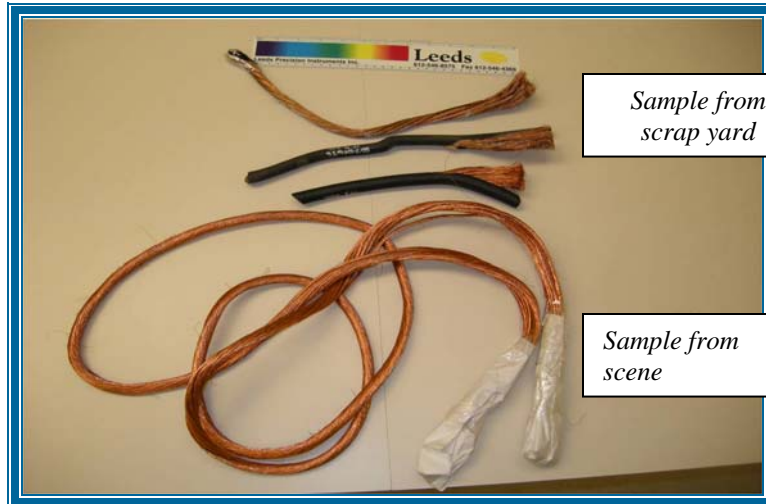
In the fall of 2008, a fatal hit and run case was submitted as a rush case for analysis and to determine a list of possible vehicles of origin. There were no suspects in the case. After characterizing the layers of a paint chip found at the scene, a PDQ database search provided a list of possible vehicles with similar paint systems. One of the possible automotive paint chips was found in the small library here at the BCA. A comparative examination was conducted which resulted in a very narrow list of two makes of vehicles over a three year span that could have been the source of the questioned paint chip. Using this information and small plastic fragments found at the scene, the submitting agency was able to narrow it down to one possible make and released a press release with the details of the type of vehicle in question. Unfortunately to date, no suspect has yet been developed.



A thin cross-section of automobile paint from this fatal hit and run case is shown above. Each of the eight layers was characterized and compared to known automobile paint layer systems in the PDQ database. A PDQ 'hit' list was generated with makes and models of possible vehicles with similar paint systems.

Due to the high value of scrap copper, the BCA has analyzed several copper cable theft cases. In this case, the suspect sold two different-sized stripped copper cables to a scrap yard. Samples of these cables were sent to the BCA along with known samples of cable remaining at the scene. Along with the general size, twisted wire construction and metal composition, traces of black insulation remained on the stripped cable which had the same composition as that on the known cables. Also, the blades on the suspect's large cutters contained traces of copper.





*Sample from  
scrap yard*

*Sample from  
scene*



*Wire Cutters from  
Suspect*



*Copper on the blades of the wire cutters*

# Criminalistics

## Crime Scene Response

During 2008, the St. Paul Crime Scene Team responded to 36 requests for assistance. Most of the requests were for death/homicide scenes. A total of 24 vehicles were also processed; some at the scene of the crime and others in the BCA garage. Three of the responses dealt with officer involved shootings where the BCA is called upon to act as the independent investigative agency. The team travelled to over 20 counties as requested.

Most cases from 2008 are pending in the legal system, but one case can be discussed here. In March of 2008, a landowner was checking his maple tree grove in rural Goodhue County and discovered what he thought was a deer carcass. A closer look revealed partial human remains with some items of clothing showing through the snow.



The Crime Scene Team responded and was subsequently joined at the scene by other forensic experts; an anthropologist and a pathologist. A tent was erected over the remains and warm air was forced inside to allow the snow and ice to melt so that any forensic evidence could be identified and collected. There were several personal items including a blank check with a name. As the snow continued to melt, a gun was observed.



Though the firearm was extremely rusted and corroded, the serial number was traced back to a name that matched the blank check. The deceased had been missing from Michigan since late summer, early fall of 2007. The skull was missing from the torso so a team of cadaver dogs was called in. They located the skull and other bones about 20 feet from the torso, buried in frozen snow. It was determined that a gunshot had passed through the mouth and exited the top of the skull. Positive identification, however, had not been established.

It had been decided that dental records would be the best means of establishing identity, but none could be located in Michigan. A family member said the decedent had lived in California. Investigators eventually located a dentist who had been retired for 15 years but still had the dental records of several patients, including the decedent's, in his basement. By an examination of unique dental work, a positive identification was made. Cause of death was determined to be a self-inflicted gunshot wound.

Though the BCA Crime Scene Team was called out to collect evidence and document the scene, it was a combined team effort of the forensic experts, a canine unit and diligent investigators that solved the case of the man who was frozen in time.

### **Firearms and Toolmark Section**

There are two trained firearm examiners in St. Paul and a part-time technician to assist the firearm examiners. A firearm examiner-trainee has been selected and will begin training in 2009.

The Firearm and Toolmark Section conducts tests on bullets, cartridge cases and firearms, restores serial numbers on firearms and vehicles, and identifies tools used to make unknown toolmarks. A comparison microscope is used for many of the examinations in the section.



*A firearm examiner using the comparison microscope*

The Firearm and Toolmark Section is unique from the other laboratory areas in that they require extensive collections of reference firearms, ammunition, books and literature. These collections are used constantly in their examinations. The firearm collection is used in part for law enforcement or training purposes, for serial number location and structure, making inoperable guns functional to allow them to be test fired, and for disassembly and comparison to evidence guns. The ammunition collection is used to test fire firearms submitted and to assist in determining information (like brand or caliber) on evidence ammunition components. The Firearm and Toolmark Section in St. Paul has a total of over 5,000 reference firearms and approximately 75,000 rounds of ammunition.

The Firearm Section of St. Paul, in 2008, increased the output of cases over 40% and decreased the backlog of cases by approximately 50% over 2007.

The majority of cases submitted to the Firearm and Toolmark Section in 2008, continues to be NIBIN (National Integrated Ballistic Information Network) cases. The NIBIN program is sponsored by the BATFE (Bureau of Alcohol, Tobacco, Firearms and Explosives). This is a computer database program that captures images of fired cartridge cases that are recovered from crime scenes or are test fired from recovered firearms. When new entries are made into the database, the program compares the images and shows the scientist possible matches. The scientist must then acquire the actual evidence and make comparisons to verify whether a match or “hit” exists.

In 2008, the BCA entered 625 cartridge case images into the St. Paul database resulting in 101 “hits”. This indicates that approximately 16% of the evidence entered into the database is linked to another shooting or to a firearm. Many of the linked crimes or guns were between different law enforcement agencies.

Looking ahead to 2009, the Firearm and Toolmark Section is looking forward to better serving the law enforcement community by providing training and reducing the backlog and turnaround time of cases. And, as always, the section hopes to find time to conduct research related to the firearm and toolmark field in order to assist other firearm examiners, law enforcement agencies, and the criminal justice community.



*Viewing images from the NIBIN database*



## Latent Prints

The section consists of seven latent print examiners and one processing specialist. As a processing specialist, Jennifer Kostroski has enabled the examiners to spend more of their time conducting comparisons.



*Jennifer Kostroski processing evidence*

With the exception of Scott Henderson, who is currently in training, all the latent print examiners have become certified through the International Association for Identification. Scott was accepted into a new, national latent print training program conducted by the National Forensic Science Training Center. This program was developed in order to standardize training nationwide for the latent print discipline.

An upgraded version of the Automated Fingerprint Identification System (AFIS) went online in July. This has greatly enhanced the search capabilities and hits have increased accordingly. The first hit on the now available palmprint database resulted in the identification of a robbery suspect.

Marty Koolen has re-encoded images in the AFIS Unsolved Latent File and with the enhanced search capabilities, new persons were identified in several older unsolved cases. These included a 1995 homicide, a 2002 assault and a 2003 home invasion/sexual assault of a minor.

Two examiners, Josh Bergeron and Glenn Langenburg, presented testimony at a Frye hearing. The latent print methods were challenged in a homicide case; the matter went on to trial where the suspect was found guilty, being immediately sentenced to life without parole.





*Josh Bergeron using a laser*

Both Josh and Glenn had research papers published in the IAI Journal of Forensic Sciences. Josh discussed the use of liquid nitrogen to separate adhesives and Glenn discussed the deposition of bloody friction ridge impressions.

Glenn also remained active as a member of the Scientific Working Group for Friction Analysis, Study and Technology (SWGFAST) keeping the discipline apprised of current trends and issues. He has also been involved with two other national groups regarding error rates and probabilities, which has been of great benefit to the BCA Laboratory. In addition, Glenn has completed research regarding a performance study of the latent print examination method as well as contextual bias.

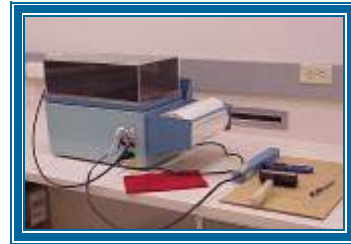
Gary Walton and Dennis Randall complete the latent print section, making solid contributions with their diligent work. Dennis and Gary add a combined 50 years of experience.

### **Forensic Documents**

The Forensic Documents section is staffed by two fully trained scientists, Shawn Gallagher and Lisa Hanson. The turnaround time has been reduced to approximately two months. The Forensic Documents section continues to offer examination services in such areas as signatures, handwriting and hand printing, typewriters, indented writing, ink, paper, mechanical impressions, photocopiers, alterations and obliterations, counterfeit documents, and the reconstruction of documents that have been shredded, burned or damaged.

The majority of Forensic Document cases still involve the examination of handwriting. Forensic Document evidence may be from a crime scene, bomb threat, money-laundering, a homicide, or a variety of other cases. However, most of the evidence

examined by the Forensic Document Section is involved with some type of forgery and most recently, terroristic threats. Examinations of signatures, indented writing, ink, paper, alterations, counterfeit documents and obliterations, may be conducted using the VSC 2000HR and/ or the Electrostatic Detection Apparatus.



**Figure 1** (*left*) depicts the Imaging Laboratory which includes the VSC 2000 (the Video Spectral Comparator) used to differentiate between inks and for other scientific examinations.

**Figure 2** (*right*) depicts the ESDA or Electrostatic Detection Apparatus. This instrument is used to detect and to lift indented writing images. Indented writing impressions can occur when paper is stacked or padded together and writing occurs on the top sheet(s) which leaves indented writing impressions on the sheet(s) below it.

### **Unusual Forensic Document cases and events**

Photographed evidence was submitted to the laboratory from a multitude of different investigating agencies. Threatening messages had been spray painted on various candidates' homes. After the handwriting examination, the agencies were able to combine their efforts because the cases were found to be connected.

Printer evidence from a crime scene was submitted to the laboratory from a crime scene. A computer printed suicide note found in a vehicle was submitted for examination. The note was compared to the victim's printer and the suspect's printer and resulted in an elimination of the victim's printer.

Handwriting examination methodology and scientific validity was challenged this year during a Frye-Mack hearing that was brought forth before a large homicide trial. After a month of preparation, a day of testimony from a BCA Forensic Document Scientist and opposing testimony from a Seton Hall Law Professor, the courts found the handwriting evidence, examination procedure and the BCA Forensic Document Examiner, all to be scientifically acceptable and admissible in a court of law.

# Toxicology

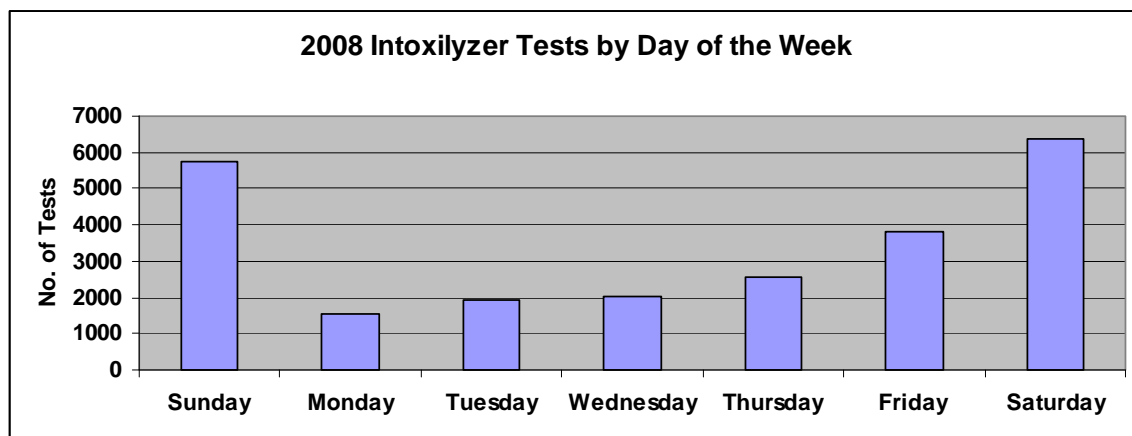
## Breath Testing

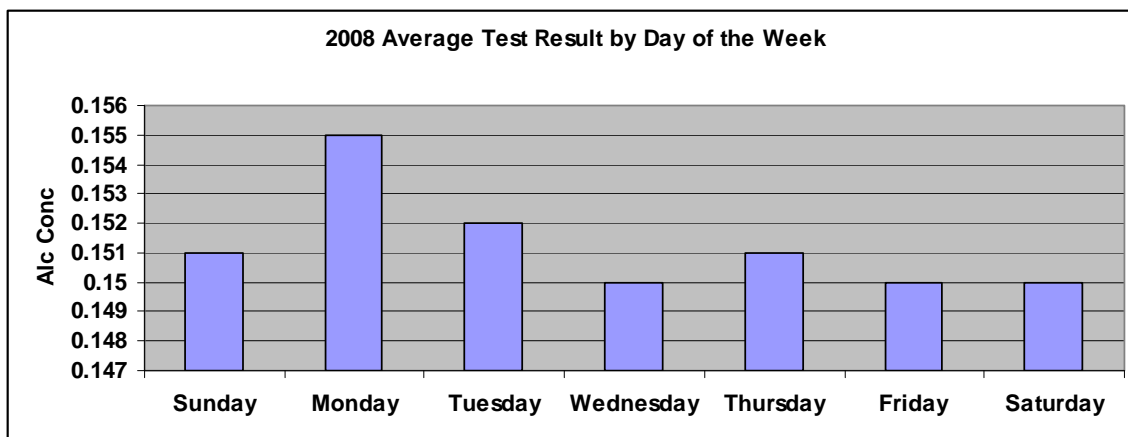
During 2008, operators certified by the BCA Breath Test Section completed more than 24,000 evidentiary breath alcohol tests statewide. Those tests took place in all of Minnesota's 87 counties. The number and broad distribution of these tests demonstrates that breath alcohol testing remains a viable testing option for the prosecution of drinking and driving offenses, even in the face of the highly publicized challenges based on source code access.

There also continues to be strong interest in the certification of new Intoxilyzer operators by Minnesota law enforcement agencies. In 2008, an additional 229 new operators were certified by the Breath Test section and 1,244 previously certified operators completed their bi-annual recertification to retain their Intoxilyzer Operator certification.

Requests for breath expert testimony have also been strong. Last year the breath test section fielded 868 requests for court testimony. Presentations by Breath Test personnel to groups like judges, attorneys and students of various types have also been in high demand.

The statewide average breath test result in 2008 was .151. Arrests for DWI are not uniformly distributed throughout the week, as the graphs below demonstrate. Most arrests occur on weekends, but the day with the highest average alcohol concentrations is Monday, which also has the fewest arrests.





The Breath Test Section, under new leadership, is focused on improving the quality of its services and adopting a more systematic approach to planning for the future. We have adopted a new and improved means of creating and disseminating usage and maintenance reports that is web based. We will continue to add materials relevant to breath testing topics to the BCA Laboratory website ([www.dps.state.mn.us/bca](http://www.dps.state.mn.us/bca)). This site has become an increasingly important source of breath testing information. Class descriptions, schedules and registration materials can be found there along with Intoxilyzer testing and replacement unit locations. Affidavits relating to current breath testing challenges are also available. The site also contains a listing of all Approved Preliminary Breath Testing Devices (PBTs). We are also open to any suggestions about additional postings.

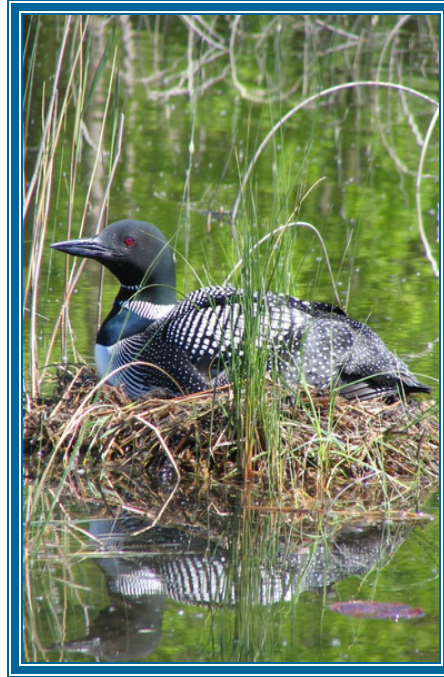
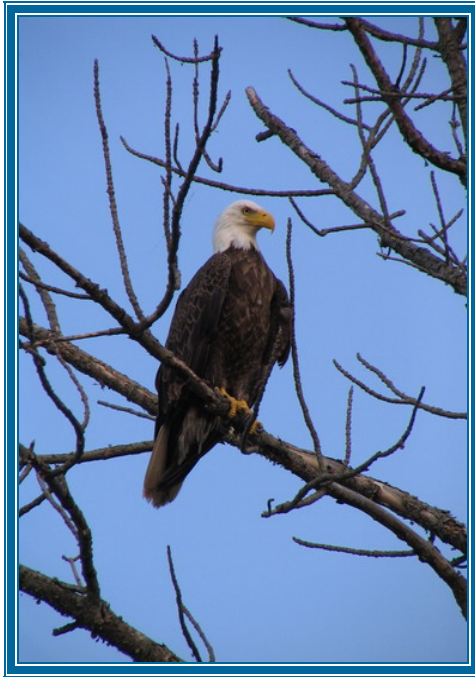
## Toxicology

The Toxicology section had a caseload increase of 70% in 2008 due to Intoxilyzer source code issues. Agencies began to submit blood or urine kits instead of utilizing breath testing. This equates to over 10,000 alcohol cases reported in 2008, 9,000 of which were DWI. As we begin 2009 we are hopeful that agencies will return to the tried and true methodology of the breath test as another reliable way of determining a subject's alcohol concentration.

Due to our increased caseload, our court activity is also up 65%. Issues this year spanned from post-consumption all the way to urine pooling. We have seen them before and are well prepared to address any concerns that may arise. We are proud to say that despite the increase we are still able to average a 10 day turn around for alcohol testing. We are striving to give our customers what they need so we are improving our drug screening capabilities with a new Liquid Chromatography Mass Spectrometry instrument (LC/MS/MS) and adding to the list of drugs we can confirm.

We now have a link on the BCA Laboratory homepage directing clients to the Board of Pharmacy to assist in determining schedules for drugs:  
[www.bca.state.mn.us/Lab.Documents/lab-Intro.html](http://www.bca.state.mn.us/Lab.Documents/lab-Intro.html)

# Bemidji Laboratory



*Images from the Bemidji area courtesy of Assistant Laboratory Director Jim Dougherty*

## **Bemidji Regional Office**

A primary goal of the BCA, by opening the regional service center in Bemidji, was to improve and enhance the quality of service to our law enforcement customers in northern Minnesota. The Laboratory in Bemidji does so, in part, by performing case work in the areas of Drug Chemistry, Crime Scene Processing, Firearms, Latent Prints and Nuclear DNA analysis. While we do not perform testing in the other areas in which the Laboratory provides analysis, we assist our northern clients by accepting all types of evidence in Bemidji and transferring any evidence necessary to our St. Paul facility. Additionally, the BCA provides training opportunities to our customers in the north both by BCA sponsored training and by allowing access to our facility for use by other law enforcement agencies.

While numbers certainly do not tell the entire story, the table below provides a glimpse into the utilization of the evidence submission services provided in Bemidji overall and specifically in the past year. The commitment to customer service remains high and we continue to strive for improvement in 2009.



Cases Submitted to Bemidji		
Section	Since Opening	In 2008
Alcohol	418	32
Chemical Testing	96	21
Crime Scene	166	19
Drugs	6,827	822
Firearms	712	48
Latent Prints	1,903	230
Mito-Trace	1	0
Nuclear DNA	1,663	297
Questioned Documents	41	0
Toxicology	292	40
Trace	149	14
<b>Total</b>	<b>12,268</b>	<b>1,523</b>

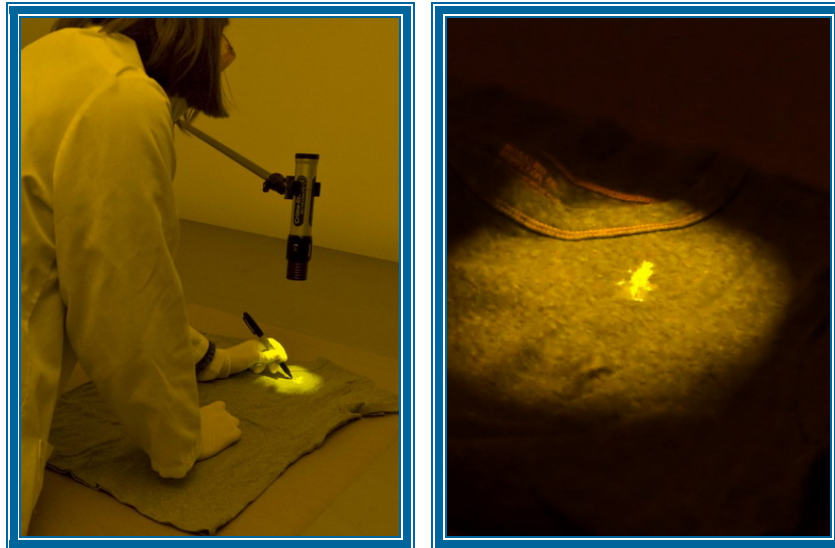


*Bear outside lunch room*

### **Biology/Nuclear DNA**

The Bemidji Biology Section has made several positive steps this past year. We finished our renovation project to make room for our newest scientist, Brent Matzke. Brent joined Sarah Pfeiffer and Michelle Pearlson to staff the section with three scientists who received nearly 300 cases last year. Brent has completed his serology training and is performing casework in that area while progressing on his DNA training. Michelle finished her DNA training and has been doing DNA casework since August. The section is also in the process of evaluating a robot to decrease the length of time needed for the

DNA analysis process. With the addition of these two scientists and maybe a robot to our casework roster, we hope to decrease our turn-around times significantly in the next year.



*The above photos depict the use of an alternate light source in locating biological evidence.*

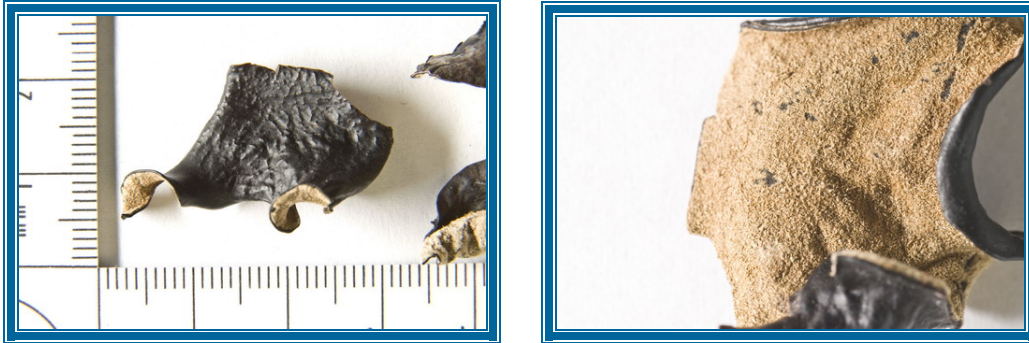


*Bear peeking into the DNA Section*

## **Drug Chemistry**

Bemidji's Drug Chemistry Section is staffed with three forensic scientists; Amy Granlund, Teresa Krall and Cori Hollingsworth. While trained section member Holly Long transferred to the Trace Evidence Section in St. Paul last year, Bemidji was fortunate to fill the vacancy with Cori Hollingsworth. Cori has previous forensic

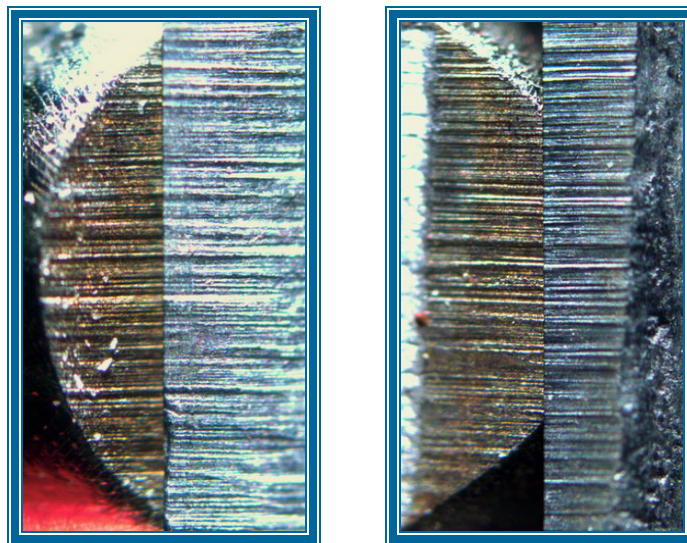
experience and should soon be performing case work. The section received almost 900 cases last year. As in Saint Paul, methamphetamine continued to be the most frequent submission with cocaine coming in second. The section saw submissions of an interesting fungus containing a hallucinogenic substance. This fungus, and the major substance associated with it, had not been previously seen or submitted to the laboratory.



*Images of hallucinogenic mushrooms*

### **Firearm and Toolmark Section**

The Firearm and Toolmark Section, staffed by Nat Pearlson, made headway on reducing the case backlog during 2008, receiving over 60 cases and reporting out over 80. Last year the Laboratory made the decision to stop entry of firearms and ammunition components into Minnesota firearms database in Bemidji. Appropriate evidence continues to be accepted in Bemidji, but all entries into the National Integrated Ballistic Information Network are now performed in the St. Paul Laboratory. This move saves limited federal resources, provides our customers with the same level of service and, hopefully, increases the efficiency of the section. The section also received some much needed reorganization of the firearm, ammunition and article reference collections from student worker Hillary Duin, a student at Bemidji State University.



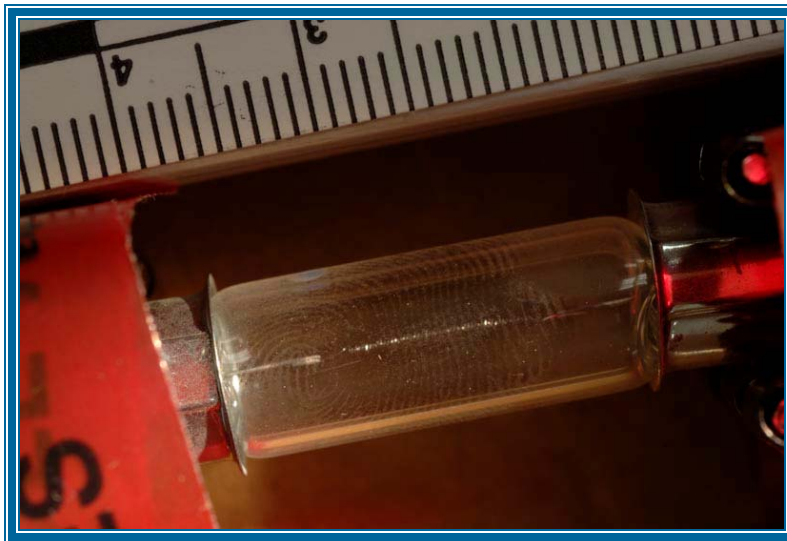
*Padlock hasp matched to test marks from a bolt cutter - both sides of cut*

## Latent Print Section

The Latent Print Section in Bemidji continued to evolve in 2008. Tonya Lindbery passed her competency test in April and is performing casework. She and the section's lead scientist, Patrick Warrick, continue to work on the section's caseload with the goal of a thirty day turnaround. The section also utilizes a latent print technician, retired BCA Senior Special Agent Steve Hagenah. Steve, whose position is funded by an auto theft prevention grant, assists in processing and documenting ridge detail on items of evidence submitted to the laboratory. As part of that grant, Steve is also tasked with providing training classes for law enforcement personnel throughout Minnesota on how to efficiently process recovered stolen vehicles and minimize the loss of latent print evidence. Steve taught nineteen classes last year and the section has seen a positive influence in the quality of the evidence submitted by agencies.

The section was able to take advantage of some valuable training last year. Tonya attended a "Statistics Applied to Ridgeology and ACE-V" course and an "Analysis of Distortion in Latent Prints" course hosted by the BCA in St. Paul. Patrick also attended the statistics course, but additionally was able to travel to Louisville, Kentucky as the International Association for Identification (IAI)-Minnesota Division Representative for the IAI Annual Training Conference.

One of the more exciting cases of the approximately 250 received by the section last year involved the kidnapping and robbery of two women from Bemidji. The defendant was allegedly hiding in their parked car and pulled a knife after they got in. The victims stated that he removed the bulb from the dome light to help hide his identity. The bulb was processed for prints and despite the small size of the bulb, approximately two centimeters, two latent fingerprints were developed. Ultimately the prints were searched in the Minnesota Automated Fingerprint Identification Network (MAFIN) and resulted in the identification and arrest of the defendant who ultimately plead guilty.



*Latent print on bulb of vehicle dome light*



## Crime Scene

The Crime Scene Team out of Bemidji responded to over 20 requests for assistance during 2008. The team lost one trained member to a position in the St. Paul lab, but maintained its eight-person complement with the addition of Brent Matzke, who also works in the DNA Section. Additionally, seven-year team member Sarah Pfeiffer took on a leadership role in the section by taking on the additional responsibilities of being one of the Team Leaders. In preparation for new accreditation standards, all section protocols and training documents were assessed and most were updated. A major training event was provided in Bemidji, a week-long shooting reconstruction school was provided to a group of team leaders. The training represents significant enhancement to previous program for shooting scene reconstruction and will better prepare team members to provide this valuable service.



*2008 shooting scene reconstruction training included hands-on training utilizing both vehicles and mock residential structures.*