

# VERMONT FORENSIC LABORATORY

## Generating Affidavits for DUI Cases

Doc. No.  
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Lab Director

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### 1.0 Purpose and Scope

**1.1** This procedure describes the review of case information and the subsequent generation of case specific infrared and/or relation-back affidavits for breath/blood ethanol results.

**1.2** The scope of this procedure includes case review, instrument file review, relation-back calculations and associated QC requirements.

### 2.0 Responsibility

**2.1** All analysts having the responsibility for generating alcohol affidavits are responsible for following this manual as written.

**2.2** This manual is reviewed periodically by the Alcohol Section staff. Revisions are made at that time or when there is an identified need to change this written manual to be compatible with changing needs in the process. In the event that there are changes to be made to this manual, the analyst must report those changes in detail to the Alcohol Section Supervisor in a timely manner.

**2.3** All analysts performing this procedure for the purpose of generating affidavits for legal purposes must be fully trained prior to the generation of any affidavits in accordance with the Alcohol Training Manual (ALC\_P300). Refer to section **6.0** regarding competency.

**2.4** All analysts understand that the estimates and opinions documented in the affidavits are those of the analyst and are made in consideration of the totality of the case. Analysts have the discretion to perform the calculations and state their opinions in accordance with their training and experience and have an obligation to express all assumptions made in this process.

### 3.0 Emergency or High Priority Situations

**3.1** The Commissioner of Public Safety, Laboratory Director or Alcohol Section Supervisor can designate affidavit requests as high priority.

**3.2** High priority affidavits are generated as soon as possible.

**3.3** Priority affidavits are reviewed and released as soon as they are available, once they pass the quality assurance criteria.

### 4.0 Procedure

#### 4.1 Case Specific Infrared Affidavits

4.1.1 These requests seek information regarding whether or not the DMT evidential breath alcohol testing instrument was working properly on the date and time of the test, whether or not the officer operated the DMT in accordance with current training procedures, and whether or not the instrument was properly

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maintained and provided an accurate and reliable result during the test in question.

### 4.1.2 Required documents (most received from requestor)

4.1.2.1 The officer's DUI processing form and affidavit

4.1.2.2 The officer's 1A supplemental affidavit (if available)

4.1.2.3 The DMT DUI Subject Test Report

4.1.2.4 Any error reports which may be associated with the Subject Test

4.1.2.5 The DMT Instrument Maintenance file

4.1.3 The analyst will document on a Case Specific Infrared Affidavit Document Review Checklist (ALC\_F400\_1) that documents listed in 4.1.2 have been reviewed.

4.1.3.1 The analyst will make notes regarding any unusual circumstances identified during the review.

4.1.4 Any unusual situations should be discussed with the Alcohol Section Supervisor and, if necessary, the State's Attorney prior to generating an affidavit.

4.1.5 Once all of the documents have been reviewed, the analyst will generate a case specific infrared affidavit based on the specific incident. See Appendix A for an example.

## 4.2 Relation Back Affidavits

4.2.1 Vermont law states that to be convicted of DUI, a person must be impaired to the slightest degree, or have a blood or breath alcohol concentration greater than 0.08 at the time they were operating the motor vehicle. Alcohol concentrations may be measured in blood or breath and presented in units of grams per 100 milliliters (g/100 ml) of blood or grams per 210 liters (g/210 L) of breath, respectively. In this document, alcohol concentrations are presented without specified measurement units, as either may apply. There is a presumptive inference (Title 23 V.S.A. § 1204) such that if the test is taken within 2 hours of the time of operation and the result is 0.10 or more, it is assumed that the person was under the influence at the time of operation. Therefore, when a test is taken outside of two hours from the time of operation, when there is evidence of alcohol ingestion within 30 minutes prior to, or any time after operation, or when the test result is under a 0.10, a relation back determination by a qualified individual to the time of operation is required.

4.2.2 Elimination rates for ethanol concentrations less than 0.01 BAC are not linear; therefore relation back calculations (aka retrograde extrapolation) will not be performed on test results below this level.

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4.2.3 Information considered when performing a relation back calculation. This information can be gathered from the documents listed in **section 4.1.2** (breath results) and/or from the case record (blood results). The arrest custody report or another document listing the subject's weight should also be submitted.

4.2.3.1 The time of the test

4.2.3.2 Test result

4.2.3.3 Time of interest (operation)

4.2.3.4 Whether or not the subject had consumed any alcohol within 30 minutes prior to, or any time after, the time of interest.

4.2.3.4.1 If alcohol had been consumed in this time period, it is also necessary to know the weight and gender of the subject and as much information regarding the drinking pattern as possible.

4.2.4 Preparing a relation back affidavit

4.2.4.1 After reviewing the information listed in **section 4.2.3** and considering the totality of the case, the analyst will calculate an estimated BAC/BrAC for the time of interest and will document their opinion in an affidavit. See Appendices B and C for examples.

4.2.4.2 Calculations will be documented. Notes will be dated and initialed and included in the case file for review.

4.2.5 Relation back calculation formula

4.2.5.1 Elimination rates can vary between individuals. The average elimination rate in DUI drivers is approximately 0.019 BAC/hour with a range of approximately 0.010-0.030 BAC/hour. The rate used in calculations by qualified individuals at the VFL is 0.015 BAC/hour. This rate was chosen because it will likely underestimate the true elimination rate for most individuals, and therefore, result in a lower estimated BAC/BrAC.

4.2.5.2 Add back 0.015 BAC per hour of time elapsed between the time of interest and the time of the test.

4.2.5.3 When six (6) hours or longer has elapsed between the time of interest and the time of the test, a range of estimated BACs will be provided. Calculation of this range will use elimination rates of 0.010, 0.015 and 0.030 BAC/hour.

4.2.6 Widmark formula for determining BAC based on the individual and their drinking pattern

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4.2.6.1 The Widmark formula will calculate the theoretical maximum BAC that would be achieved in an individual based on the drinking pattern. This calculation can also be used in relation forward estimations.

$$4.2.6.2 \text{ BAC} = \frac{(\# \text{ oz})(\text{ABV})}{(\text{Wt lbs})(\rho \text{ factor})(0.184)}$$

4.2.6.2.1 Rho factor for males is 0.68

4.2.6.2.2 Rho factor for females is 0.61

4.2.7 A standard drink is considered a 12 oz beer at 5% ABV, a 1.5 oz shot of liquor at 40% ABV or a 5 oz glass of wine at 12% ABV. Specific alcohol information is preferred, but when not available, a standard drink is used.

### 5.0 Affidavit Documentation in FA

5.1 Affidavit requests are tracked in FA.

5.2 The affidavit request and supporting documentation is entered as virtual evidence into FA to initiate and track the request, even though it is not considered evidence by the VFL. This virtual evidence may be destroyed in FA by the Alcohol Section Supervisor upon completion of the affidavit(s) for that case. All affidavit requests and completed affidavits are stored electronically in the Object Repository within FA as well as in the physical case file; documents in these locations are not destroyed during this process.

### 6.0 Quality Criteria and Corrective Action

6.1 Analysts will ensure that all affidavits are completed in a timely manner and that all documents generated and calculations performed are accurate to the best of their knowledge. Analysts will include all required documents and review of the required documents as they are pertinent to the affidavit. All calculations will be documented in the supporting packet.

6.2 All analysts performing this procedure must be thoroughly trained in accordance with the Alcohol Training Manual (ALC\_P300) prior to the generation of any affidavits. Topics include blood alcohol physiology and pharmacology with emphasis on absorption, distribution and elimination of alcohol and certification in the appropriate use and maintenance of the DMT evidential breath testing instrument.

6.3 Prior to release of a completed affidavit, an administrative and technical review will be completed by a qualified individual using QA\_F100\_5.9\_1\_Affidavit Review Checklist.

6.3.1 A qualified individual is a person previously qualified at the VFL to generate and review the type of affidavit requiring review (i.e. case-specific IR, relation back blood, relation back breath).

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**6.4** Upon completion of the administrative and technical review, a director review will be completed by the Alcohol Section Supervisor, or their designee, using QA\_F100\_5.9\_1\_Affidavit Review Checklist.

### **7.0 References**

**7.1** ALC\_F400\_1\_Case Specific Infrared Affidavit Document Review Checklist

**7.2** QA\_F100\_5.9\_1\_Affidavit Review Checklist

**7.3** VFL Alcohol Reference Library

**7.4** Appendix A – Example of Case Specific Infrared Affidavit

**7.5** Appendix B – Example of Relation Back Affidavit - Breath

**7.6** Appendix C – Example of Relation Back Affidavit - Blood

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### APPENDIX A: Example of Case Specific Infrared Affidavit

State v. Jane Doe

Case Number 14VFL12345

**NOW COMES Chemist, affiant, being duly sworn and on oath, deposes and says:**

- 1) The information contained in this affidavit is true and accurate to the best of my knowledge.
- 2) I am a chemist employed by the Vermont Forensic Laboratory.
- 3) On November 18, 2014, I reviewed the affidavit, processing form, and DMT evidence ticket of Trooper John Doe with regard to an arrest of Jane Doe for Driving under the Influence of alcohol. The date of arrest was November 9, 2014.
- 4) In the affidavit, the officer indicates that the motorist submitted to an evidentiary breath test using DMT 12345, an infrared device. I reviewed the maintenance records for this instrument.
- 5) I have been trained by the manufacturer of the DMT to operate, calibrate, certify, maintain, repair and install these instruments.
- 6) The evidential breath alcohol testing device in use in Vermont is the DMT, an instrument which employs infrared absorption as its method of analysis. Through rulemaking, the principle of absorption of infrared energy has been adopted as an approved method of breath alcohol testing.
- 7) Through rulemaking, performance standards have been established for all breath tests. The DMT meets the performance standards because:
  - A) The DMT is capable of accepting and analyzing a subject's exhaled alveolar, or deep lung air (breath).
  - B) The DMT is capable of analyzing replicate samples containing a known concentration of alcohol with a precision of plus or minus 5% from their mean when alcohol concentrations are reported to three significant figures. The DMT reports results as the number of grams of alcohol per 210 liters of breath (g/210L).
  - C) The DMT meets and exceeds the minimum test accuracy required by rule for alcohol testing of plus or minus 10% or 0.005 g/210L, whichever is greater, when analyzing a simulated breath sample of a known concentration, when alcohol concentrations are reported to three significant figures. This demonstrated capability directly extends to accurately evaluating a breath sample.
  - D) The DMT is capable of detecting the presence of compounds in breath which could potentially interfere with the accurate determination of a breath alcohol concentration.
  - E) The DMT and the methods used for determination of breath alcohol concentration for evidential purposes have been approved by the Commissioner of Public Safety.
- 8) The DMT has been tested and has been found to be an accurate and reliable instrument for measuring alcohol content of a breath sample. The DMT has also been tested and approved by the federal government as an evidentiary device. The DMT appears on the Department of Transportation, National Highway Traffic Safety Administration's list of Conforming Products published in the Federal Register (**Federal Register** Vol. 77, No. 115 Thursday, June 14, 2012).

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- 9) A DMT result obtained by an officer certified to operate the instrument and acquired in accordance with the procedures incorporated in the Vermont Criminal Justice Training Council Student Manuals in effect at the time of testing and approved by the Commissioner of Public Safety, is accurate and reliable and is in compliance with the provisions of the Department of Public Safety's rules.
  
- 10) After reviewing the affidavit, processing form, DMT evidence ticket in this case, and the maintenance records for this instrument, and based upon my knowledge of the workings of the DMT, I believe that the instrument used in this case meets the performance standards and that the test result of 0.202 at 1031 hours on 11/9/2014 is an accurate and valid indication of the alcohol content in the motorist's system at the time of the test.

Dated at Waterbury in the county of Washington, Vermont this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Chemist, Affiant**

Subscribed to and sworn before me on this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Notary Public**

My commission expires \_\_\_\_\_

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**APPENDIX B: Example of Relation Back Affidavit - Breath**

State v. Jane Doe

Case Number 14VFL12345

**NOW COMES Chemist, affiant, being duly sworn and on oath, deposes and says:**

- 1) I am a chemist employed by the Vermont Forensic Laboratory.
- 2) I have testified in Vermont as an expert witness in the field of analytical chemistry, blood alcohol physiology and pharmacology and on the workings of the DMT instrument. I have been qualified as an expert witness in every court in which I have testified.
- 3) Given particular factual information, I am able to estimate breath alcohol concentration [BrAC] values for breath samples obtained at a particular time for an earlier specific time. This estimate is founded upon known principles of absorption and elimination of alcohol by the human body.
- 4) Given the following facts in the case
  - a. Time of breath sample collection: XXXX hours
  - b. Result of analysis for alcohol: 0.XXX g/210 L
  - c. Subject is a GENDER weighing XXX pounds
  - d. Time of operation: XXXX hours
- 5) And the assumptions that:
  - a. The subject's alcohol elimination rate was 0.015 g/210 L/hr
  - b. The last alcoholic beverage, 1 XX (XX oz, X% ABV) was consumed after the crash
- 6) I have calculated that the BrAC at the time of operation would have been approximately 0.XXX g/210 L. This takes into account a test value of 0.XXX g/210L plus 0.XXX g/210 L resulting in an interim value of 0.XXX g/210 L. The value added is the estimated amount of alcohol eliminated between the time of operation and the time of the test.
- 7) Using the Widmark formula, I calculated the approximate BrAC that would have been produced for this subject based on the beer consumed to be 0.XXX g/210 L. I then subtracted this amount from the interim value resulting in 0.XXX g/210 L. In this scenario it is conservatively assumed that all of the alcohol from the beer consumed after the crash would have been in effect at the time of testing but none of it would have been in the subject's system at the time of operation.
- 8) The stated estimate of BrAC at XXXX hours is based on information provided to me by Officer John Doe and applies specifically and only to that information noted above. The value calculated is an estimate due to the recognized variables in the analytical process and in biological and physiological variations among individuals.

Dated at Waterbury in the county of Washington, Vermont this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Chemist, Affiant**

Subscribed to and sworn before me on this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Notary Public**

My commission expires \_\_\_\_\_

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**APPENDIX C: Example of Relation Back Affidavit - Blood**

State v. Defendant

Case Number 14VFL00012

**NOW COMES Chemist, affiant, being duly sworn and on oath, deposes and says:**

- 1) I am a chemist employed by the Vermont Forensic Laboratory.
- 2) I have testified in Vermont as an expert witness in the field of analytical chemistry, blood alcohol physiology and pharmacology. I have been qualified as an expert witness in every court in which I have testified.
- 3) Given particular factual information I am able to estimate blood alcohol concentration [BAC] values for blood samples obtained at a particular time for an earlier specific time. This estimate is founded upon known principles of absorption and elimination of alcohol by the human body.
- 4) Given the following facts in the case
  - a. Time of blood sample collection: XXXX hours
  - b. Result of analysis for alcohol: 0.XXX ± YYY g/100 mL, 99.7% level of confidence
  - c. Time of operation: XXXX hours
- 5) And the assumptions that:
  - a. The subject's alcohol elimination rate was 0.015 g/100 ml/hr
  - b. The last alcoholic beverage was consumed at least XX minutes prior to operation
- 6) I have calculated that the BAC at the time of operation would have been approximately 0.XXX g/100 ml. This takes into account a test value of 0.XXX g/100 ml plus 0.XXX g/100 ml. The value added is the estimated amount of alcohol eliminated between the time of operation and the time of the test.
- 7) The stated estimate of BAC at XXXX hours is based on information provided to me by OFFICER and applies specifically and only to that information noted above. The value calculated is an estimate due to the recognized variables in the analytical process and in biological and physiological variations among individuals.

Dated at Waterbury in the county of Washington, Vermont this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Chemist, Affiant**

Subscribed to and sworn before me on this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
**Notary Public**

My commission expires \_\_\_\_\_

