Technical Procedure for Clandestine Laboratory Analysis

1.0 Purpose - To provide the Forensic Scientist with a general guideline of how to process evidence from a suspected clandestine laboratory.

2.0 Scope - This procedure applies to Forensic Scientists in the Drug Chemistry Sections of the State Crime Laboratory.

3.0 Definitions

- **Clandestine Laboratory –** an illicit operation consisting of a sufficient combination of apparatus and chemicals that either has been or could be used in the manufacture or synthesis of controlled substances.

4.0 Equipment, Materials and Reagents - See Section technical procedures as needed.

5.0 Procedure

5.1 Standards and Controls - N/A

5.2 Calibrations - N/A

5.3 Sampling - See the Drug Chemistry Section Administrative Procedure for Sampling and the Drug Chemistry Section Technical Procedure for Drug Analysis.

5.4 Evidence Handling and Paperwork

5.4.1 Samples are either brought back to the State Crime Laboratory in the custody of the responding Forensic Scientist who processed the clandestine laboratory site or submitted for analysis from other agencies.

5.4.2 If evidence has been seized from a crime scene, the responding Forensic Scientist will ensure that all items of evidence are sealed, labeled, and placed in a secure storage locker upon his/her return to the Laboratory.

5.4.3 Upon return from a clandestine laboratory site, the responding Forensic Scientist will complete the Request for Examination Form and the Short Technical Field Assistance (TFA) form and submit to the Evidence Control Section by the end of the next business day after his/her return to the State Crime Laboratory.

5.4.4 This serves to give the case a Laboratory Identification Number and to initiate the chain of custody for the evidence in the FA System.

5.4.5 As soon as the case has been given a Laboratory Identification Number, this number shall be documented on all items of evidence.

5.4.6 Within 48 hours of his/her return to the Laboratory, the responding Forensic Scientist shall provide a copy of his/her field notes (or a typed inventory) to the SBI Site Safety Officer and the requesting officer.

5.5 Clandestine Laboratory Cases in the FA System

5.5.1 Field notes and Laboratory analysis notes shall be compiled into two different case records in the FA System.

5.5.2 The field notes FA case record shall include:

5.5.2.1 Clandestine Laboratory Response Form (see Section files for printable version).

5.5.2.2 A copy of the responding Forensic Scientist's handwritten field notes (or typed inventory) from the clandestine laboratory site.

5.5.2.3 Short and Long Technical Field Assistance (TFA) form.

5.5.2.3.1 Note: the Short TFA shall be scanned into the RFLE for the FA case record.

5.5.2.3.2 Note: the Long TFA is generated in the FA System and serves as an official report listing the various substances found/seized/destroyed at the clandestine laboratory site.

5.5.2.4 Any clandestine laboratory site photographs taken by the responding Forensic Scientist.

5.5.2.5 Percent yield calculations pertaining to (pseudo)ephedrine packaging found and identified at the scene.

5.5.2.6 A copy of the responding Forensic Scientist's Curriculum Vitae (CV) or Statement of Qualifications.

5.5.2.7 Copies of any administrative documents (e.g., e-mails/communication logs to other officers involved in the investigation, court documents, etc.)

5.5.3 The Laboratory analysis FA case record shall include:

5.5.3.1 Request for Examination of Physical Evidence Form as completed by the responding Forensic Scientist or North Carolina State Bureau of Investigation Site Safety Officer.

5.5.3.1.1 Note: the Request for Examination of Physical Evidence Form shall be scanned into the RFLE for the case record.

5.5.3.1.2 If liquids are submitted for laboratory analysis, the total volume, pH, and respective layer (if applicable) shall be documented.

5.5.3.1.3 The name of the Site Safety Officer sampling the evidence at the crime scene shall also be documented.

5.5.3.2 Any and all data pertaining to the Laboratory analysis of items seized from the clandestine laboratory site for processing at the Laboratory.

5.5.3.3 A copy of the responding Forensic Scientist's Curriculum Vitae (CV) or Statement of Qualifications.

5.5.3.4 Copies of any administrative documents, including the destruction order pertaining to the submitted evidence.

5.5.3.5 Percent yield calculations pertaining to (pseudo)ephedrine collected from the scene and identified at the laboratory.

5.5.4 Clandestine Laboratory Case Files shall be reviewed by the Forensic Scientist Manager or his/her designee.

5.6 Analysis of Clandestine Laboratory Evidence

5.6.1 Based on his/her training and experience, a Forensic Scientist shall select samples to analyze, keeping in mind that items of evidence containing the critical components to demonstrate fully the manufacture or intent to manufacture a controlled substance shall be worked.

5.6.1.1 In addition to the controlled substance, precursor and essential chemicals shall be identified when possible.

5.6.2 Solid Materials and Powders

5.6.2.1 Solid materials and powders shall be sampled and analyzed according to the Drug Chemistry Section Technical Procedure for Drug Chemistry Analysis and in accordance with the Drug Chemistry Section Administrative Procedure for Sampling.

5.6.2.2 Solids and powders that are likely inorganic in composition (example: iodine and phosphorus) shall be transferred to the Trace Evidence Section of the Laboratory for identification.

5.6.2.2.1 In cases where the item of evidence is from a suspected red phosphorus/iodine methamphetamine lab and the substance appears to be reaction material, the Forensic Scientist shall analyze a portion of the material to determine if methamphetamine and/or (pseudo)ephedrine are also present and send a subsequent untested portion of the material to the Trace Evidence Section for elemental analysis, when sample size allows.

- A sub-item shall be created for the portion of the material being transferred to the Trace Evidence Section for analysis and all evidence transfers shall be recorded in the FA System.

5.6.2.2.2 In cases where phosphorus is identified in an item of evidence, the Forensic Scientist shall document the color of the item in the FA worksheet.

5.6.3 Liquid Samples

5.6.3.1 The pH of liquid samples prior to analysis and total volume of liquid found at the clandestine laboratory site shall be recorded in the FA worksheet.

5.6.3.2 If bi-layered or multi-layered liquids are present, each layer will be sampled and analyzed separately. The Forensic Scientist shall thoroughly document the physical appearance of each layer as well as the location of each layer relative to others.

5.6.3.3 If the total volume of liquid was seized, the net weight shall be determined prior to analysis and reported with applicable measurement assurance.

5.6.3.4 If the total volume of liquid was not seized at the site, the density of analyzed liquid samples shall be determined in order to calculate the total weight of liquid present at the clandestine laboratory site. Measurement assurance data is not required since reported weights are truncated to the whole number.

5.6.3.4.1 The total volume of the original liquid found at the crime scene is required with submission information in order for a weight calculation of the original liquid to be reported. The following statement shall be included in the results:

5.6.3.4.1.1 "Based on the total volume of the original liquid reported on the Request for Examination of Physical Evidence Form, Item X contained XX grams(s) of liquid containing XX – Schedule X."

Example: Total volume of liquid at the clandestine laboratory site = 250 mL. A 3.0 mL sample of the liquid was placed on the balance, resulting in a mass of 2.60 grams. The chemical analysis of the liquid revealed methamphetamine. What is the total weight of the liquid containing methamphetamine found at the site?

Density = mass/volume
= 2.60 g/3.0 mL
= 0.86 g/mL
Therefore,
0.86 g/mL x 250 mL = 215 g of liquid containing methamphetamine

5.6.3.5 The miscibility of liquid samples shall be determined using either water or a water insoluble solvent such as chloroform or hexane and recorded in the FA worksheet.

5.7 Technical Field Assistance (TFA) Reports

5.7.1 The TFA report (Long Form TFA generated in the FA System) shall describe the clandestine laboratory site searched, the date and time of the search, who was present at the clandestine laboratory site, and list the chemicals and equipment found at the clandestine laboratory site that are consistent with the manufacture of a controlled substance.

5.7.2 A qualifying statement about each item, where applicable, shall be included along with that item's regulatory status.

5.7.3 Items seized for Laboratory analysis shall be labeled as such including the corresponding Laboratory item number (in bold type font).

5.7.4 For items of (pseudo)ephedrine, the total grams or milligrams of (pseudo)ephedrine shall be listed after each container or unit described, based upon the total number of tablets and the strength of each tablet.

5.7.4.1 Example:
Sudafed 12-hr Extended Release
One box (intact) containing a total of 20 tablets
Pseudoephedrine HCl, 120 mg per tablet
2.4 g (2400 mg) pseudoephedrine HCl total

5.7.5 A "Summary" section shall be added to the TFA report and include the following:

5.7.5.1 The method of manufacture of the controlled substance and precursor chemicals if applicable.

5.7.5.2 The total grams of (pseudo)ephedrine present at the clandestine laboratory site shall be listed along with the total grams of methamphetamine that could be produced based on a 100 % yield (see Section Files for Printable versions).

5.7.5.2.1 100 % theoretical yield calculation for methamphetamine (meth) HCl from (pseudo)ephedrine(PSE) HCl

Molecular weight of (pseudo)ephedrine HCl = 201.7 g/mol
Molecular weight of methamphetamine HCl = 185.7 g/mol
1 mol PSE HCl = 1 mol meth HCl

$$\frac{201.7 \text{ g/mol PSE HCl}}{\#\text{ g PSE HCl at Site}} = \frac{185.7 \text{ g/mol methamphetamine HCl}}{X \text{ g of methamphetamine HCl}}$$

$$X \text{ g of meth HCl} = \frac{(\#\text{g PSE HCl at site})(185.7 \text{ g/mol meth HCl})}{201.7 \text{ g /mol PSE HCl}}$$

5.7.5.2.2 The Forensic Scientist shall clearly differentiate when calculating percent yield between items involving pseudoephedrine HCl versus pseudoephedrine sulfate.

5.7.5.2.3 100 % theoretical yield calculation for methamphetamine (meth) HCl from (pseudo)ephedrine (PSE) sulfate

Molecular weight of (pseudo)ephedrine sulfate = 428.5 g/mol
Molecular weight of methamphetamine HCl = 185.7 g/mol
1 mol PSE SO_4 = 2 mol meth HCl

$$\frac{\text{428.5 g/mol PSE } SO_4}{\text{\# g PSE } SO_4 \text{ at Site}} = \frac{\text{(2 mol meth HCl)}}{\text{1 mol PSE } SO_4} \times \frac{\text{185.7 g/mol meth HCl}}{\text{X g of meth HCl}}$$

$$\text{Xg of meth HCl} = \frac{\text{(\#g (pseudo) } SO_4 \text{ at site)(2 mol meth HCl/1 mol (PSE } SO_4\text{)(185.7 g/mol meth HCl)}}{\text{428.5 g /mol (pseudo)ephedrine } SO_4}$$

5.7.6 A "Seizure of Evidence" section shall be added to the TFA report and shall include the numbers of Laboratory item(s) seized for analysis, the location of the State Crime Laboratory at which the evidence is being processed, and the Laboratory case number.

5.7.7 A "Hazardous Waste" section shall be added at the end of the Long TFA report and shall include the date and disposition of the chemicals and equipment not seized for evidence during the clandestine laboratory site search.

5.8 Return and/or Destruction of Clandestine Laboratory Evidence

5.8.1 Solids and powders (with the exception of reaction material, red phosphorus, and iodine crystals) shall be returned to the requesting agency.

5.8.2 Liquid and sludge samples shall be retained unless another disposition is indicated by a court order.

5.8.2.1 Evidence shall be destroyed according to the State Crime Laboratory Hazardous Waste Management Program as outlined in the State Crime Laboratory Safety Manual.

5.8.2.2 Upon release of the laboratory report, a notation shall be made in the clandestine laboratory evidence destruction calendar as to when the item(s) is eligible for destruction based upon the disposition.

5.8.2.2.1 Clandestine laboratory evidence destructions will be conducted on a monthly basis.

5.8.2.2.2 If the date of eligibility does not correspond with the date of destruction, or if circumstances prevent the Forensic Scientist from destroying the evidence at that time, the evidence will be destroyed at the next available opportunity.

5.8.2.3 The Forensic Scientist shall complete the Destruction Verification Form and scan a signed copy into the Case Record Object Repository in the FA System. (See Section Files for Printable version.) The case record shall then be republished.

5.8.3 Technical Field Assistance (Long Form TFA) Reports shall be "Transferred Out" in the FA System with a comment stating that the TFA is a report only and has no evidence associated with it. A copy of the TFA report shall be included with a copy of the Laboratory Report to be returned to the Evidence Control Unit and subsequently the requesting agency.

5.9 Calculations – See **5.7.5**.

5.10 Uncertainty of Measurement – See the Procedure for Measurement Assurance and Drug Chemistry Technical Procedure for Balances.

6.0 Limitations - N/A

7.0 Safety - See the State Crime Laboratory Safety Manual.

8.0 References - N/A

9.0 Records

- FA System Case files
- Clandestine Laboratory Response Form
- Verification Review for the Destruction of Evidence
- Yield Calculations Methamphetamine HCl from (Pseudo)ephedrine HCl
- Yield Calculations Methamphetamine HCl from (Pseudo)ephedrine Sulfate

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document for conversion to ISO standards.
02/15/2013	2	**2.0** – Scope changed to reflect all three laboratories. **5.5.2.5** – Updated to clarify yield calculations pertaining to (pseudo)ephedrine packaging found and identified at the scene. **5.5.3.5** – Section added to include yield calculations pertaining to (pseudo)ephedrine collected at the scene and identified at the laboratory. **5.6.2.2** – "and" added between the two compounds in example **5.6.2.2.1** – Corrected "analyzed" to "analyze" **5.6.3.3** – Added statement regarding weight if entire volume collected from crime scene. **5.6.3.4** to **5.6.3.6** – Reformatted numbers. **5.7.5.2.3** – Typo corrected in g/mol of Pseudoephedrine sulfate. **5.8.2** – Phrase added to clarify "after the date the report is released."
05/10/2013	3	**5.3** and **5.6.2.1 -** Revised name of Sampling Plan from Technical to Administrative Procedure **5.6.3.3** and **5.6.3.4** – Clarified weights and reporting required for seized liquids **5.10** – Added references to other procedures for Uncertainty of Measurement
07/31/2013	4	**5.8.2.1 –** Updated name of Destruction Verification Form **5.10 –** Updated name of Procedure for Measurement Assurance **5.5.2.3.2** – Deleted for
11/15/2013	5	Added issuing authority to header; removed references to SBI-5.
08/29/2014	6	**5.7.4.1** – Correct typo (2400 mg, not 2440 mg) **5.7.5.2.3** – Correct typo - MW of meth HCl not PSE HCl = 185.7 g/mol
05/15/2015	7	**5.6.3.4.1**, **5.6.3.4.1.1 –** Added requirement of original volume with submission information and clarified wording as a result of using submitted information in calculation. **5.6.3.5** – Deleted outdated wording for results.
10/19/2015	8	**Header -** Revised issuing authority **1.0 - 10.0** - Removed references to "Clandestine Laboratory Certified" chemists and clarified references to the "Request for Examination *of Physical Evidence*" Form **5.4.1** – Added reference to submitted clan labs **5.4.2** –Specified application to evidence received from a crime scene **5.4.6** – Clarified responding Forensic Scientist **5.5.3.1** – Inserted reference to NCSBI Site Safety Officer **5.5.3.1.2** – Added documentation requirements for submitted liquids **5.5.3.1.3** – Inserted documentation requirement of Site Safety Officer **5.5.3.4** – Added reference to destruction order **5.6.3.4.1.1** – Removed " upon return to the lab" and adjusted to

		3.0 ml in example **5.7.5.2.1** – Inserted mole ratio for conversion between PSE HCl and Meth HCl **5.7.5.2.3** – Removed references to PSE HCl **5.8.2** – Updated disposition for liquid and sludge samples **5.8.2.1** – Added republication requirement for case record
04/07/2017	9	**Original 5.8.2.1 –** Moved to new **5.8.2.3** **Original 5.8.2.2 –** Moved to new **5.8.2.1** **Original 5.8.2.2.1 –** Removed **5.8.2.2 –** Added requirement to document when evidence is eligible for destruction **5.8.2.2.1 and 5.8.2.2.2 –** Defined how often destructions are done and outlined steps to take if a destruction date is missed