

## Suspicious Substance Sampling Instructions

### 1. Identify Sampling Strategy

Once samples must be taken, an appropriate sampling strategy must be chosen. Depending on the situation, different types of sampling methods may be utilized. A Bulk Sample (such as an intact envelope) may be the first choice as it is often easiest to obtain and yield a larger amount of product for the lab to work. The following are the types of samples:

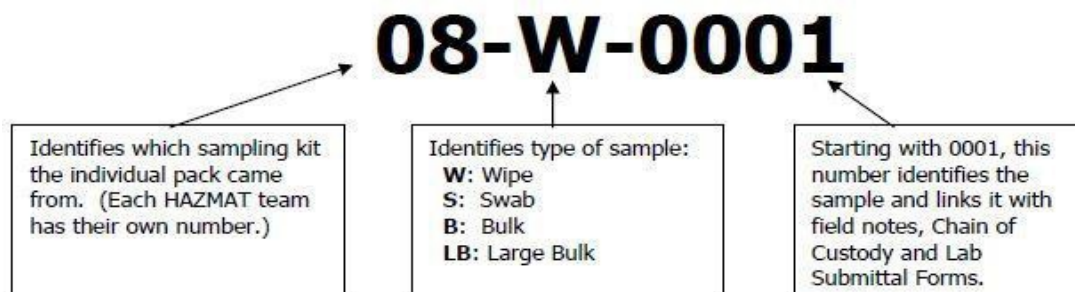
- **Wipe Sample:** Wipe samples may be used in a situation where there is a large amount of unknown material (powder) spread around an open surface such as a table top.
- **Swab Sample:** Swab samples may be used where the unknown material is in a hard to reach location, such as a keyboard or ductwork.
- **Bulk Sample:** Bulk samples, such as an entire envelope or piece of carpet.
- **Large Bulk Sample:** The same sampling technique as the bulk sample, except the large bulk sample pack contains larger packaging.

### 2. Choose a Sampling Pack

Each Sampling Kit contains individual Sampling Packs for each type of sample listed above. Every sampling pack is identified by a pre-designated, specific **Unique Identifying Number (UIN)**. The UIN will clarify:

- Which RRT the pack belongs to.
- What type of sample it is.
- A numerical 4 digit number which identifies that specific sample.

Below is a sample UIN:



(continued next page)

### 3. Using the Sampling Packs

Each sample pack will contain the appropriate paperwork and sampling materials to take ONE sample. If multiple samples are needed at one site, use more than one pack. Each pack contains a Chain of Custody form and Lab Submittal form along with the other essential sampling supplies. The sampling pack will have its own Unique Identifying Number (described above) which will be visible on the forms as well as other items which will be transported to the lab. On the following pages, you will find a sampling protocol for each of the types of sample packs.

### 4. Transport of Finished Samples

Once samples have been double packaged and properly decontaminated they are ready for transport (with the Chain of Custody and Lab Submittal forms) to the NC State Lab Public Health. Place swab, wipe and smaller bulk samples in a sealable biohazard bag (after decon) and then into an STP 250 box (shown below). Write UIN for sample(s) contained within the STP-250 on the outside of the box. Ice packs should be used when available to refrigerate samples during transport.

#### **Examples of Category A shipping containers**

\*Shipping of large bulk samples which will not fit in the Category A box will be handled on an individual basis. Do **NOT** use paint cans.



BioPack-2 Packaging



Saf-T-Pak® STP-100  
Category A Ambient Shipping



Saf-T-Pak® STP-110  
Category A Ambient Shipping



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APPENDIX C1 BULK SAMPLE PROTOCOL

## Bulk Sample Protocol

Bulk samples are collected to detect and characterize the presence of biological and/ or chemical contamination on building and environmental materials such as sections of carpet, office equipment, supplies, vials of dust, mail clothing, heating, ventilation and air conditioning (HVAC) filters, etc. or to test powders or liquids that are self- contained (e.g., powder in an envelope).

### Equipment and Materials

Bulk sample packs are pre-packaged and include everything necessary to take bulk samples up to the size of an 8.5x11 envelope (if folded) or similar. Every pack is pre- labeled with a unique identifying number and should include:

- 1 copy of the Bulk Sample Protocol
- Primary bag (1gallon, zip lock, pre-labeled)
- Secondary bag (1gallon, zip lock, pre-labeled)
- Chain of Custody and Lab Submittal forms (pre-labeled)
- Field marker (to mark site of sample location, if needed)

## **Procedure**

Before entry:

- 1)** Remove envelope from sample pack containing Chain of Custody and State Lab Submittal forms. Each form should be pre-labeled to match that particular sample pack. **These forms should remain in the cool zone.**
- 2) Review Downrange procedures(below).

# Bulk Sample Protocol

Downrange:

- 1) After entry, remove primary bag from secondary bag.
- 2) Flatten the primary bag to remove excess air BEFORE (not after) placing sample in bag. Place sample into bag. Close the primary bag and decontaminate.
- 3) Place primary bag into secondary bag using same technique.
- 4) Radio the following information out to the cool zone:
  - Type of sample
  - Time and date of sample
  - Name of person collecting sample
  - Approximate size of area sampled
  - Map and/or description of sample location
- 5) Proceed to designated decontamination area. Decontaminate double bagged sample with 10% bleach solution (commercially purchased or made fresh day of use) or other approved decontaminant known to kill anthrax spores i.e. Dahlgren or Cavicide.
- 6) Place decontaminated double bagged sample into Category A box.

North Carolina Suspicious Substance Response Guidelines



Pictures show one bulk sample kit complete with: Sampling Protocol, State Lab and Chain of Custody Forms, Primary and Secondary Ziploc bags, and field location marker.



All items packaged together.

APPENDIX C2 LARGE BULK SAMPLE PROTOCOL

## Large Bulk Sample Protocol

Large Bulk samples are collected to detect and characterize the presence of biological and/or chemical contamination on much larger samples of building and environmental materials such as sections of carpet, office equipment, supplies, mail personnel clothing, heating, ventilation and air conditioning (HVAC) filters.

### **Equipment and Materials**

Large Bulk sampling packs are prepackaged and contain everything required to take a large bulk sample. Every pack is pre-labeled with a unique identifying number and should include:

- Copy of Instructions
- Two Large Slide Lock Containment Bags (To Be Used as Inner/Outer).
- Chain of Custody and Lab Submittal Forms (Pre-Labeled)
- Field Marker (To Mark Site of Sample Location, If Needed)

### **Procedure**

Before entry:

1. Remove envelope from sample pack containing Chain of Custody and State Lab Submittal forms. Each form should be pre-labeled to match that sample
2. The forms should remain in the coolzone
3. Review Downrange procedures(below).

## Large Bulk Sample Protocol

Downrange:

1. After entry, remove both 28"x28" sampling bags from pack and use one as a primary bag and one as a secondary bag.
2. Place the large bulk sample (<12X12) into the primary bag using one person to hold the bag open. Avoid getting excess air in bag, DO NOT squeeze air out of bag once sample is inside (could create aerosol). Close the primary bag and decontaminate.
3. Place closed primary bag into secondary bag using same method.
4. Radio the following information out to the cool zone:
  - a Type of Sample
  - b Time and Date of Sample
  - c Name of Person Collecting Sample
  - d Approximate Size of Area Sampled
  - e Map and/or Description of Sample Location
5. Proceed to designated decontamination area. Decontaminate double bagged sample with 10% bleach solution (commercially purchased or made fresh day of use) or other approved decontaminant known to kill anthrax spores i.e. Dahlgren or Cavicide.
6. Place decontaminated double bagged sample into a Category A box.

# North Carolina Suspicious Substance Response Guidelines



Pictures show contents of large bulk sampling pack: Chain of Custody and Lab Submittal forms and two 28"x28" (Inner & Outer) slide lock bags.

All items packaged together.





APPENDIX C3 WIPE SAMPLE PROTOCOL

## Wipe Sample Protocol

The wipe sample method is used for sample collection on large (>100cm<sup>2</sup>), non-porous surfaces such as tabletops, counters, desks, file cabinets, windowsills, floors, mailboxes and non-carpeted floors.

### Equipment and Materials

Wipe sampling packs are prepackaged and contain everything required to take a wipe sample. Every pack is pre-labeled with a unique identifying number and should include:

- 1 Copy of The Wipe Sample Protocol
- 1 Zip Lock Bag, Pre-Labeled
- Sterile 2x2 Gauze & Saline Bottle
- Sterile Specimen Cup, Pre-Labeled
- Chain of Custody and Lab Submittal Forms (Pre-Labeled)
- Field Marker (To Mark Site of Sample Location, If Needed)

### Procedure

Before entry:

1. Remove envelope from sample pack containing Chain of Custody and State Lab Submittal forms. Each form should be pre-labeled to match the sample pack. **These forms should remain in the cool zone.**
2. Review Downrange procedures (below).

# Wipe Sample Protocol

## Downrange:

1. After entry, remove sampling materials from 1-gallon zip lock bag. Place cup into 1-gallon zip lock bag.
2. Using sterile gloves, remove 2x2 gauze and add several drops of phosphate-buffered saline onto gauze.
3. Wipe the surface using the following technique: Recommended wipe area is approximately 1 square foot. Unfold the 2x2 gauze completely and then fold in half. Make enough vertical S-strokes to cover the entire sample area. Fold the exposed side of the gauze in and make horizontal S-strokes over the same area. Fold the exposed side of the gauze in once more and wipe the same area using diagonal S-strokes. Avoid letting pad dry completely, however do not add additional saline to remoistened gauze.
4. Fold the gauze, exposed side in, and place it into the sterile specimen cup.
5. Place cup in 1-gallon Ziploc bag and decontaminate.
6. Radio the following information out to the cool zone:
  - a. Type of Sample
  - b. Time and Date of Sample
  - c. Name of Person Collecting Sample
  - d. Approximate Size of Area Sample
  - e. Map and/or Description of Sample Location
7. Proceed to designated decontamination area. Decontaminate bagged sample with 10% bleach solution (commercially purchased or made fresh day of use) or other approved decontaminant known to kill anthrax spores i.e. Dahlgren or Cavicide
8. Place decontaminated sample into red biohazard bag and then into the Category A box.

# North Carolina Suspicious Substance Response Guidelines



Pictures show one wipe sample kit complete with: Sampling Protocol, State Lab and Chain of Custody Forms, sterile specimen cup, saline bottle, sterile 2x2, secondary (Ziploc bag), and field location marker.

All items packaged together



## Swab Sample Protocol

The swab method is used for sample collection of small volumes of powders or liquids on smaller, non-porous surfaces that do not have a large accumulation of dust and dirt such as keyboards, hard to reach areas within machinery, mail sorters, and ventilation grilles.

### Equipment and Materials

Swab sampling packs are prepackaged and contain everything required to take a swab sample. Every pack is pre-labeled with a Unique Identifying Number and should include:

- 1 Copy of The Swab Sample Protocol
- 1 Zip Lock Bag, Pre-Labeled
- Sterile Dacron Swab, Pre-Labeled
- Sterile Buffered Saline Bottle
- Chain of Custody and Lab Submittal Forms (Pre-Labeled)
- Pre-Labeled Field Marker (To Mark Site of Sample Location, If Needed)

### Procedure

#### Before entry:

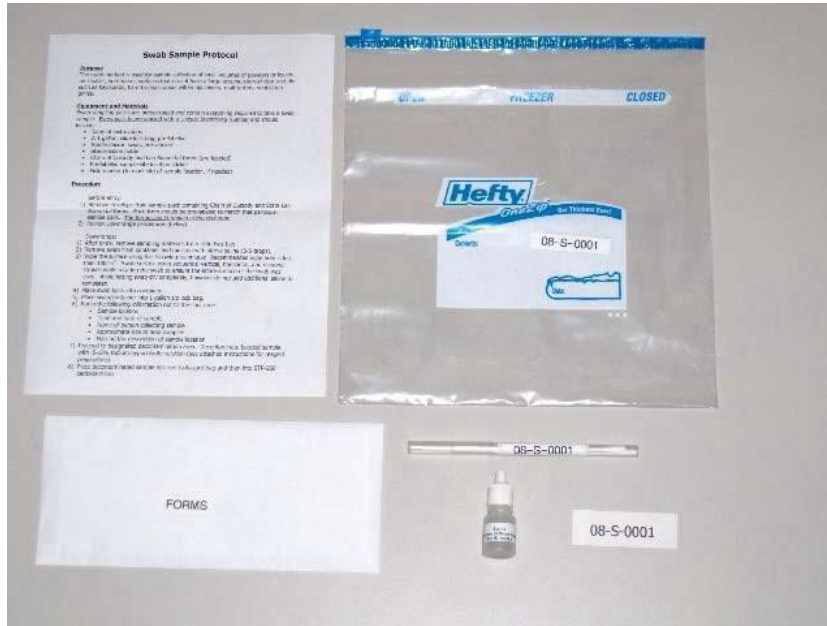
1. Remove envelope from sample pack containing Chain of Custody and State Lab Submittal forms. Each form should be pre-labeled to match the sample pack. **These forms should remain in the cool zone.**
2. Review Downrange procedures (below).

## Swab Sample Protocol

### Downrange:

1. After entry, remove sampling materials from Ziploc bag.
2. Remove swab from container and moisten with sterile saline (3-5 drops).
3. Wipe the surface using the following technique: Recommended wipe area is less than 100cm<sup>2</sup>. Swab target surface using sequential vertical, horizontal, and diagonal strokes while rotating the swab to ensure the entire surface of the swab was used. Avoid letting swab dry completely, do not add additional saline to remoisten.
4. Place swab back into container and cap (primary). Decontaminate.
5. Place swab/container into 1-gallon Ziploc bag.
6. Radio the following information out to the cool zone:
  - a Time and date of sample
  - b Name of person collecting sample
  - c Approximate size of area sampled
  - d Map and/or description of sample location
7. Proceed to designated decontamination area. Decontaminate bagged sample (secondary) 10% bleach solution (commercially purchased or made fresh day of use) or other approved decontaminant known to kill anthrax spores i.e. Dahlgren or Cavicide.
8. Place decontaminated sample into Category A box.

# North Carolina Suspicious Substance Response Guidelines



Pictures show one swab sample kit complete with:

Sampling Protocol, State Lab and Chain of Custody Forms, sterile swab, saline bottle, secondary containment (Ziploc) bag, and field location marker.



All items packaged together.

# Liquid Sample Protocol

## **Purpose**

Liquid samples are collected for public safety purposes to detect and characterize suspicious or unknown substances such as biological or non-biological hazardous hazards to the public health and safety.

Liquid sampling equipment, tools and techniques will be dictated by the type of suspicious substance product sample (chemical or biological) and the size of the container, if any holding the product (e.g., residual material pooled on a surface or in a container).

The tools and equipment used for Sample Collection must be Certified Sterile and be polypropylene. The collection of liquids in most cases include the following:

- Transfer Pipette (Certified Sterile, Polypropylene)
- Transfer Pipette Pump (Certified Sterile, Polypropylene)
- Wipes – 2”X2” Dacron/Polyester Gauze (DO NOT Use Cotton)
- Sterile Dacron/Polyester Swab (DO NOT Use Cotton)
- COLIWASA (Combined Liquid Waste Sampler) Tube (Certified Sterile, Polypropylene)

Sample packs are pre-packaged and include everything necessary to take samples up to the size of an 8.5x11 envelope (if folded) or similar. Every pack is pre-labeled with a unique identifying number and should include:

- Primary bag (redbiohazard)
- Secondary bag (2 quarts, slidelock)
- Chain of Custody and Lab Submittal forms (pre-labeled)

# Liquid Sample Protocol

The following are examples of tools and equipment that will also be needed as listed above.



Sterile Disposable Pipette Clean



Polypropylene Jars



Sterile Centrifuge Tube



COLIWASA Sampler



Sterile Pipette with Pump



# Liquid Sample Protocol

## Equipment and Materials

### Supplies

- Certified Sterile PPE Container (125ml)
- Sterile Polypropylene Containers (500ml)
- 2" x 2" Dacron Gauze
- Disposable Hemostat
- Lab Mat Absorbent Liner for Clean Surface Work Area
- Labels
- Evidence Tamper Tape
- Nitrile Gloves
- Custody
- Disposable Transfer Pipettes
- Disposable Syringe With Tubing

### Sampling Equipment and Containers Warning

Samples collected as Biological or Chemical samples **MUST** be collected in polypropylene, containers and by plastic pipettes or Dacron swabs. Glass equipment or containers should not be used because it interferes greatly with the TRF assay for Ricin and Chemical instruments analysis.

# Liquid Sample Protocol

## Procedure

### General

This protocol is intended for a two-person sampling team to conduct the sampling procedure in the hot zone; the procedure should not be performed by a single individual.

The First Team Member (Assistant Sampler/Sample Facilitator) is responsible for communication, photography (FBI Laboratory Publication, Handbook of Forensic Services 2003), ensuring that the sample collection sheet is filled out, and Facilitating Sample Collection (for example, opening and handing materials to the sampler as required, including sample collection containers, gloves, swab, laminated card, other sampling materials, and packaging materials).

The Second Team Member (Sampler) collects the sample and is the only individual to contact the Suspicious Substance. The sampler is responsible for signing the final Chain-of-Custody form outside of the hot zone.

Some jurisdictions may have standard operating procedures requiring the collection of negative controls. Sampling teams should refer to standard operating procedures regarding the collection of any negative controls (also referred to as field and media blanks). Negative controls include unopened sampling media and any wetting solutions. Blanks must be submitted for each lot number used.

All Sample Team members must don a new pair of non-powdered nitrile examination gloves over the gloves that are part of standard PPE ensemble (Sample Team members will have three or more layers of gloves on) for each sample collected. Sample Teams must use appropriate aseptic techniques to minimize cross contamination and sample collusion.

APPENDIX C6 SAMPLING TECHNIQUES

## Swab Sampling Technique

Samples collected as biological or chemical samples **MUST** be collected in plastic, preferably polypropylene, containers and by plastic pipettes or Dacron swabs. Glass equipment or containers should not be used because it interferes greatly with the TRF assay for ricin and chemical instrument analysis.

Dacron tip swabs are recommended for small area environmental sampling and for cracks and crevices. Swabs may be used to sample liquid material on a nonporous surface such as a desktop, floor or other similar surface. Swabs are appropriate for sampling small surfaces or hard to reach locations of less than 4 inches square (in<sup>2</sup>), like crevices, corners, supply air diffusers, air return grills.



Swab sampling technique

Moisten the sterile swab by dipping it in the 10 mL container of phosphate buffer saline solution. Remove any excess liquid by pressing the swab head on the inside surface of the buffer solution container. Once a sterile swab has been moistened, the remaining neutralizing buffer solution and container must be discarded.

Wipe the swab over the surface where the substance was originally found, using closely spaced vertical S-strokes or Z-strokes over the entire sampling area.

Roll the swab handle (end of the plastic stick furthest from absorbent material) between fingers to rotate the swab, thereby exposing a fresh surface. Wipe the swab over the entire area again, this time using horizontal S-strokes or Z-strokes over the surface. The swab area should preferably not exceed the maximum recommended area of 8 by 8 in. (400 cm<sup>2</sup> or 64 in<sup>2</sup>).

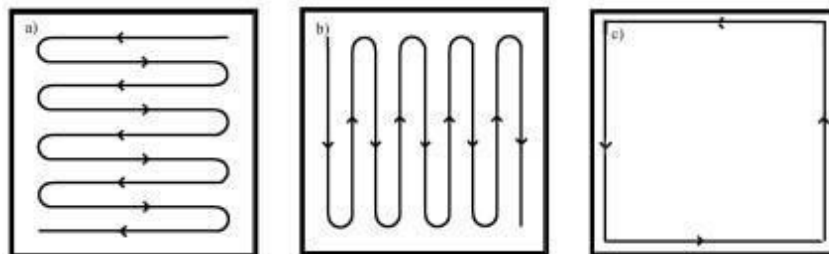
Place the head of the swab directly into a sterile screw-capped centrifuge tube. Break off the head of the swab by bending the handle. The end of the swab handle, touched by the collector, should not touch the inside of the tube.

## Wipe Sampling Technique

When the sample product is visible on a surface are, or the area to be sampled is at least 100 cm<sup>2</sup>. The wipe sample is taken using the S-Wipe method. Recommended wipe area is approximately 1 square foot. Make enough vertical S-strokes to cover the entire sample area. Flip wipe material over and with the unexposed side of the pad, make horizontal S-strokes over the same area. Avoid letting pad dry completely, however do not add additional saline to remoisten pad.



Wipe sampling technique



## Sampling of Bulk Liquids

The sampling bulk liquids should be performed in accordance with the protocols of ASTM **D 5743** in conjunction with the protocols established by the State laboratory of Public Health and local SOPs for chemical, biological and radiological samples.

This protocol is intended for use in collecting samples of bulk single and multilayered liquids, with or without solids, from drums or similar containers ranging from smaller liquid container of a few milliliters up to 110 gallons, including those that are unstable, ruptured, or otherwise compromised. The size, condition and accessibility of the liquid container will have a significant impact on the selection of sampling equipment.

Samples should be collected in accordance with the appropriate ASTM Standard, local SOPs, the site work plan and sampling plan. Correct sampling procedures must be applied to conditions as they are encountered depending upon whether the sample is suspected of being chemical, biological or radiological in nature. It is impossible to specify rigid rules describing the precise manner of sample collection because of the many variable and unknowns associated with each liquid sampling situation. It is essential that the samples be collected by a trained and experienced sampler and in accordance with State Laboratory of Public Health (SLPH) protocols for the collection of chemical and biological samples. Bulk contained liquids, stratified or unstratified, clear or containing solids must be sampled in accordance with approved SLPH protocols for suspected biological or chemical samples in order to ensure viable forensic analysis. When complex liquid samples are encountered, contact the SLPH for advice on sampling equipment and collection protocols.

The sampling equipment, sample preparation equipment, sample containers, etc. must be clean, dry, and inert and appropriate to the material being sampled. All equipment, including sample containers, must be inspected before use to ensure that they are clear of obvious dirt and contamination and are in good working condition. Visible contamination must be removed, and the equipment must be decontaminated with the appropriate rinse materials.

Decontaminated sampling equipment should be protected from contamination. This may include, but not be limited to: storage in aluminum foil, plastic bags, polytetrafluoroethylene (PTFE) film, or other means of protection that will not impact the sample quality or intended analysis.

## Liquid Draw Sampling Technique

When a sample product is visible on a surface area, or the area to be sampled is small in diameter (approximately 10cm x10cm, or 4 x 4 inches), it is recommended that the sampling team use the swab sampling technique or a small sterile pipette.

Liquids that are on surfaces in larger amounts or in containers can be drawn into a disposable pipette (certified clean, or sterile PPE/Teflon/PET for chemical substances and sterile plastic for biological substances) and transferred into the primary sample container. Plastic or polypropylene pipets and sample containers should be used for mixed Chemical / Biological samples.



Syringe with Tubing  
Sterile Pipette with Pump



A syringe with tubing can be used to draw liquid samples from areas or containers with small openings or are otherwise inaccessible by other sampling techniques.

The tubing can be weighted if necessary. It is lowered into the liquid. The material is then drawn into the tube and transferred into the primary sample container.

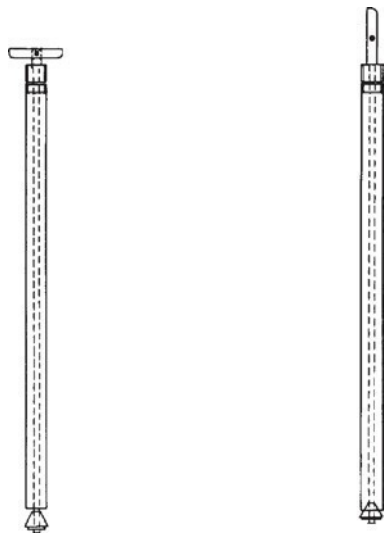
## COLIWASA Sampling Techniques

The following describes the procedure for sampling liquids with the composite liquid waste sampler, or “COLIWASA.” This sampling technique is based on ASTM D 5495-03.

The COLIWASA is an appropriate device for obtaining a representative sample from **stratified** or **unstratified bulk liquids** that are contained. Its most common use is for sampling bulk containerized liquids, such as tanks, barrels, and drums. It may also be used for large pools and other open bodies of stagnant (not flowing) liquid.

A limitation of the COLIWASA is that the stopper mechanism may not allow collection of approximately the bottom inch of material, depending on construction of the stopper.

The COLIWASA is used to obtain a vertical column of liquid representing an accurate cross-section of the sampled material. To obtain a representative sample of stratified liquids, the COLIWASA should be open at both ends so that material flows through it as it is slowly lowered to the desired sampling depth. The COLIWASA must not be lowered with the stopper in place. Opening the stopper after the tube is submerged will cause material to flow in from the bottom layer only, resulting in gross over-representation of that layer.



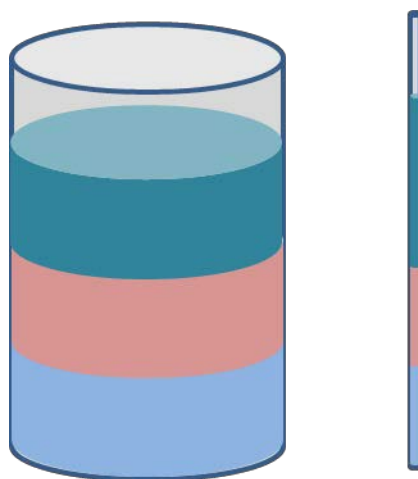
Sampling  
Position  
Stopper Open

Stopper Closed

## COLIWASA Sampling Techniques

As in all cases where biological or chemical samples are suspected, a plastic or polypropylene COLIWASA should be used for sample collection rather than glass. Use the following procedure when collecting samples using the COLIWASA Sampler.

- Make certain the COLIWASA is clean and functioning properly. It is essential that the stopper at the bottom of the sampling tube closes securely.
- Open the COLIWASA by placing the stopper mechanism in the open position.



- Lower the COLIWASA into the liquid slowly so that the levels of the liquid inside and outside the sampler tube remain about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and a non-representative sample will result.
- Use the stopper mechanism to close the COLIWASA when it reaches the desired depth in the liquid.
- Withdraw the sampler from the liquid. Either wipe the exterior of the sampler tube with a disposable cloth or rag or allow excess liquid to drain back into the waste container.
- Carefully discharge the sample into a suitable container by slowly opening the stopper mechanism while the lower end of the COLIWASA is positioned in the sample container.
- Seal the sample container; attach the label and seal.



## **COLIWASA Sampling Techniques**

### **Assistant Sampler Duties:**

The Assistant will keep sample items sealed until just before use to prevent cross-contamination. Aseptic techniques will be used whenever handling the sample product, its containers, and any tools used to collect the samples.

1. Lay down the clean drop cloth to create a clean work area, and place materials on drop cloth.
2. Ensure the following items are documented through radio communication between hot and cold zone personnel and finalization of paperwork in the cold zone prior to sending the sample to the laboratory:
  - Assure that each sample has a unique sample number or identifier
  - Sample location and address
  - Type of sample
  - Time and date of sample
  - Names and signatures of persons collecting sample
  - Measured size of the area sampled
  - Map of sample area including; photos of sample area showing sample locations
3. Prepare all sampling tools and implements for use by the sampler and hand to sampler as needed.
4. Remove the lid from the primary sample container and hand to the sampler.
5. Take the sealed primary sample- decontaminate first- from the sampler and place into secondary sample container if appropriate. The secondary container should be secured by placing absorbent material inside to contain any possible leakage.

## **COLIWASA Sampling Techniques**

6. Place sealed sample into sample transport container for decontamination.
7. Rinse or wipe the outside of the sealed plastic bags containing the primary source, powder sample(s), and swab(s) with decontamination solution— do not dry the outside of the bags afterwards as this will allow appropriate decontamination solution contact time. The outer surface of the larger sealed plastic bag should be decontaminated using a 10 % bleach solution adjusted to a pH of 7.
8. Place decontaminated sample into Category A box.
9. Complete chain-of custody form.
10. Repeat procedure for each sample collected.

### **Sampler Duties**

1. Collect the sample using a technique appropriate to the condition of the sample and transfer into the appropriate primary container using the appropriate technique used for either chemical or biological samples.
2. Place the sample into the appropriate primary sample container and seal the lid. (clockwise direction) around the container lid (as shown in the figure below) to safeguard the sample and reduce the possibility of leakage of the sample from the primary container to the secondary container.
3. Place tamper tape over the primary container lid.
4. Place the sealed primary sample container into a transparent pre-labeled secondary container which should be held by the assistant. Do not touch the outside of the bag.
5. Hand sealed primary sample to assistant sampler for final packaging and decontamination.
6. Repeat procedure for each sample collected