



Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biothreat agents from Nonporous Surfaces¹

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1. Scope

- 1.1 These practices address collection of visible powders that are suspected biothreat agents from solid nonporous surfaces using a bulk collection method, using a dry swab and laminated card, followed by a swab sampling method using a sterile moistened swab. Bulk powder samples are collected and packaged in a manner that permits the maximum amount of the sample to be safely transported to a reference laboratory within the Centers for Disease Control and Prevention (CDC) national Laboratory Response Network (LRN)² for confirmatory identification and safe storage. If the source of the powder is a letter or small package, that item is also packaged in a manner that permits it to be safely transported to a LRN reference laboratory. A sterile moistened swab may be used to collect residual powder and may be used to conduct on-site biological assessments for the purpose of testing for biothreat agents.
- 1.2 These practices are performed in coordination with the Federal Bureau of Investigation (FBI) as part of a risk assessment including hazard assessment and threat evaluation.
- 1.3 Sample Collection Method A covers the bulk collection and packaging of suspicious visible powders that are suspected biothreat agents from solid nonporous surfaces.
- 1.4 Sample Collection Method B covers swab sampling of residual suspicious powders that are suspected biothreat agents from solid nonporous surfaces. Swab samples can be used for on-site downstream measurements. All samples suspected to be biothreat materials must be collected according to Sample Collection Method A and sent to a LRN reference laboratory. Results from on-site biological assessments are not definitive; only a LRN reference laboratory can confirm the presence of a biothreat material.
- 1.5 These practices incorporate reference guidance for packaging and transport of suspicious visible powders to comply with all appropriate federal regulations regarding biosafety and biosecurity.
- 1.6 These practices should only be used to collect visible samples that are suspected biothreat agents and have been field screened according to reference guidance for explosive hazard, radiological hazard, and other acute chemical hazards.
- 1.7 The bulk sample collection practice and the swab sampling practice are recommended for collecting amassed or dispersed powder samples from all nonporous surfaces on which the suspicious powder sample is clearly visible.
- 1.8 These practices are not recommended for samples on porous materials such as upholstery, carpeting, air filters, or ceiling tiles.

¹ These practices are under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and are the direct responsibility of Subcommittee E54.01 on CBRNE Sensors and Detectors.

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² The CDC Laboratory Response Network is the network responsible for handling clinical specimens and environmental samples containing suspected biothreat agents.



- 45 1.9 These practices are recommended for collecting visible powders where the bulk of the
46 powder sample is amassed or dispersed over a limited area (optimally, area should be
47 less than 20 by 20 cm (approximately 8 by 8 in.) or 400 cm² (approximately 64 in²).
- 48 1.10 These practices are to be performed by personnel who are adequately trained to work
49 with hazardous materials in the hot zone (see NFPA 471, NFPA 472, or OSHA
50 1910.120). Personnel performing collection or screening under these practices shall be
51 adequately trained in the use of sampling equipment, materials, and procedures. This
52 includes personnel performing the prior initial chemical and radiological screening.
53 Personnel should use the appropriate level of personal protective equipment (PPE) to
54 mitigate hazards during collection and screening.
- 55 1.11 These standard practices should be used in accordance with ASTM WK 26640
56 Operational Guidelines for Initial Response to a Suspected Biothreat Agent guidance
57 for best practices for planning, training and evaluation of competency.
- 58 1.12 Committee E54 gratefully acknowledges the Sampling Standards Task Group of
59 AOAC International as co-leaders with ASTM in the standard's development and
60 adoption, and joins them in inviting the collaboration of all stakeholders in regard to
61 the evolution of the document.
- 62 1.13 The values stated in SI units are to be regarded as the standard. The values given in
63 parentheses are for information only.
- 64 1.14 *This standard does not purport to address all of the safety concerns associated with its*
65 *use. It is the responsibility of the user of this standard to establish appropriate safety*
66 *and health practices and determine the applicability of regulatory limitations prior to*
67 *use.*

70 2. Referenced Documents

- 71
- 72 2.1 *NFPA Standards:*³
- 73 NFPA 471 Recommended Practice for Responding to Hazardous Materials
74 Incidents, 1997 Edition
75 NFPA 472 Standard for Competence of Responders to Hazardous
76 Materials/Weapons of Mass Destruction Incidents, 2008 Edition
77 NFPA 1994 Standard on Protective Ensembles for Chemical/Biological Terrorism
78 Incidents
- 79 2.2 *IATA Standards:*⁴
- 80 IATA PI 602 Infectious Diseases (Infectious Substances)
81 IATA PI 650 Shipping of Diagnostic Samples
82 IATA DGR 46th Edition, 2005
83 IATA DGR Addendum I, January 2005
84 IATA DGR Addendum II, March 2005
85 IATA DGR Addendum III, July 2005
- 86 2.3 *Federal Government Regulations:*⁵
- 87 DOT - 49 CFR, Parts 171-180, Hazardous Materials Regulations
88 DOT - 49 CFR 172 Subpart H, Transportation Training
89 DOT - [49 CFR 173](#), General Requirements for Shipments and Packagings
90 DOT - 49 CFR [178](#), Specifications for Packagings

³ Available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269—9101

⁴ Available from the International Air Transport Association, 800 Place Victoria, PO Box 113, Montreal-H4Z 1M1, Quebec, Canada.

⁵ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, and also available online from Occupational Safety and Health Administration (www.osha.gov).



91 EPA - [40 CFR 300](#), National Oil and Hazardous Substances Pollution Contingency
92 Plan (NCP)
93 EPA - [40 CFR 311](#), Worker Protection
94 NRC - [10 CFR 20](#), Standards for Protection against Radiation
95 NIOSH - [42 CFR 84](#), Respiratory Protective Devices
96 OSHA - 29 CFR 1910 Subpart Z and 29 CFR 1926 Subpart Z, Toxic and
97 Hazardous Substances
98 OSHA - 29 1910.1096 and 29 CFR 1926.53, Ionizing Radiation
99 OSHA - 29 CFR 1910.120, Hazardous Waste Operations and Emergency
100 Response (HAZWOPER) standard
101 OSHA - 29 CFR 1910 Subpart I (Sections 132 to 139), Personal Protective
102 Equipment
103 OSHA - 29 CFR 1910.1200, Hazard Communication
104
105

106 *2.4 Federal Guidance:*

107 OSHA - CPL 02-02-073, [Inspection Procedures for 29 CFR 1910.120 and](#)
108 [1926.65, Paragraph \(q\): Emergency Response to Hazardous Substance Releases](#)
109 NIOSH Publication No. 2009-132: Recommendations for the Selection and Use of
110 Respirators and Protective Clothing for Protection Against Biological Agents
111 FBI Laboratory Publication: Handbook of Forensic Services 2003
112

113 *2.5 ANSI Standards:*

114 ANSI Z41-1999: American National Standard for Personal Protection - Protective
115 Footwear
116 ANSI Z87.1-2003: American National Standard for Occupational and Educational
117 Personal Eye and Face Protection Devices
118 ANSI Z88.2-1992: American National Standard Practices for Respiratory
119 Protection
120 ANSI Z88.10-2001: American National Standard for Personal Protection -
121 Respirator Fit Testing Methods
122 ANSI/ISEA Z89.1-2003: American National Standard for Personal Protection -
123 Protective Headwear for Industrial Workers Requirements
124 ANSI/Compressed Gas Association, CGA G-7.1-1997, Commodity Specification
125 for Air
126

127 *2.6 ASTM Standards:*

128 ASTM WK 26640: Operational Guidelines for Initial Response to a Suspected
129 Biothreat Agent
130 ASTM F-2412-2005: Standard Test Methods for Foot Protection
131 ASTM F-2413-2005: Specification for Performance Requirements for Foot
132 Protection
133

134 *2.7 International Association of Fire Chiefs (IAFC) Guidance:*

135 Model Procedures for Responding to a Package with Suspicion of a Biological
136 Threat, October 2008
137
138
139

140 **3. Terminology**



- 141
142 3.1 *Definitions:*
143 3.1.1 *aseptic technique, n*—operation or performance of a procedure or method under
144 carefully controlled conditions to reduce the risk of exposure and prevent the
145 introduction of unwanted material/matter (contamination) into a sample.
146 3.1.2 *biothreat agent, n*— any microorganism, virus, infectious substance, or biological
147 product that may be engineered as a result of biotechnology, or any naturally occurring
148 or bioengineered component of any such microorganism, virus, infectious substance,
149 or biological product, capable of causing: death, disease or other biological
150 malfunction in a human, an animal, a plant, or another living organism; deterioration
151 of food, water, equipment, supplies, or material of any kind; or, deleterious alteration
152 of the environment (18 USC 175)
153 3.1.3 *bulk powder, n*—a visible powder, at least approximately 1 teaspoon or 5 ml in volume
154 amassed or dispersed over a limited area (optimally, area should be less than 20 cm by
155 20 cm (approximately 8 in by 8 in).
156 3.1.4 *chain of custody, n*—set of procedures and documents to account for the integrity of
157 sample by tracking its handling and storage from point of sample collection to final
158 disposition of the sample.
159 3.1.5 *cold zone, n*— also known as Clean Zone or Support Zone (CPL 02-02-071 Directive);
160 the uncontaminated area where workers are unlikely to be exposed to hazardous
161 substances or dangerous conditions.
162 3.1.6 *confirmatory analysis, n*— analysis that definitively identifies the presence of a
163 suspected substance or agent. Confirmatory analysis of a biothreat for public health
164 action can only be performed by a LRN national or reference laboratory.
165 3.1.7 *decontamination*—the reduction or removal of biothreat material from surfaces (for
166 example, skin) by cleaning and washing.
167 3.1.8 *hazard, n*— Something that is potentially dangerous or harmful, often the root cause of
168 an unwanted outcome; a danger or peril.
169 3.1.9 *hot zone, n*—also known as Exclusion Zone or ExZ (CPL 02-02-071 Directive); the
170 area, located on the site where contamination is either known or expected and where
171 potential for greatest exposure exists.
172 3.1.10 *incident commander (IC)*—the individual responsible for all incident activities,
173 including the development of strategies and tactics and the ordering and release of
174 resources. The IC has overall authority and responsibility for conducting incident
175 operations and is responsible for the management of all incident operations at the
176 incident site.
177 3.1.11 *field screening*— field measurements utilized early in the site assessment process to
178 define and delineate the contaminants present, support tactical decision making and
179 address operational safety measures. Field screening does not include measurements
180 of biological properties which is termed on-site biological assessments (see 3.1.12).
181 3.1.12 *on-site biological assessment, n*—measurements of properties inherent to biological
182 materials performed in the field using rapid, field based procedures and assays.
183 3.1.13 *personal protective equipment (PPE), n*— Includes personal protective
184 equipment for eyes, face, head, and extremities, protective clothing, respiratory
185 devices and protective shields and barriers designed to protect employees from serious
186 workplace injuries or illnesses resulting from contact with biological, chemical,
187 radiological, physical, electrical, mechanical or other hazards.
188 3.1.14 *presumptive test, n*—non-definitive test used to screen for the presence of a
189 substance or agent, or the presence of signatures of a substance or agent.
190 3.1.15 *risk, n*— the probability of suffering a loss or harm or injury: peril.



- 191 3.1.16 *threat, n*— An indication of possible violence, harm, or danger and may include an
192 indication of intent and capability.
- 193 3.1.17 *warm zone, n*—also known as the contamination reduction zone or CRZ (CPL
194 02-02-071 Directive); the transition area between the Exclusion Zone (ExZ or hot
195 zone) and the Support Zone (SZ or cold zone) used to reduce and limit the amount of
196 contamination on people and equipment, and in the air, water, and soil that may be
197 transferred into nonhazardous areas; the CRZ contains decontamination facilities, and
198 functions as a buffer zone surrounding the ExZ.

199 200 4. Significance and Use

- 201
- 202 4.1 Prior to these practices, there have been no validated standard methods by ASTM for
203 collecting, packaging, and transporting suspicious visible powder samples that are sus-
204 pected biothreat agents. Collection of a bulk powder material from a nonporous
205 surface using a sterile swab and laminated card as the collection devices to move the
206 material into a container will depend on several factors, including (but not limited to):
207 (1) amount of visible powder present; (2) sample composition; (3) choice of collection
208 device; (4) size and shape of the collection container; (5) ability of the powder to
209 become aerosolized; (6) texture and porosity of the surface; (7) humidity; (8) and
210 electrostatic properties of powders and collection tools/containers.
- 211 4.2 Similarly, prior to these practices, there have been no validated standard methods for
212 sampling suspicious visible powders for on-site analysis, although wipe and swab
213 sampling are often employed in the field. The ability to collect suitable samples from
214 nonporous surfaces using a sterile moistened swab will depend on the following
215 factors: (1) swabbing procedure; (2) swab material; (3) sample composition; and (4)
216 texture of the surface.
- 217 4.3 These practices standardize suspicious powder collection and packaging procedures
218 and swab sampling procedures in order to reduce exposure risk, to reduce variability
219 associated with sample handling and sample analysis, and to increase reliability of
220 sampling visible powder samples from nonporous surfaces.

221 222 SAMPLE COLLECTION METHOD A—BULK SAMPLE COLLECTION

223 224 5. Scope

- 225
- 226 5.1 This sample collection method applies to the bulk collection and packaging of
227 suspicious visible powders that are suspected biothreat agents from solid nonporous
228 surfaces.
- 229 5.2 These practices are performed in coordination with the FBI and receiving LRN
230 reference laboratory after a risk assessment including a hazard assessment and threat
231 evaluation is conducted and the sample is deemed to potentially be a credible threat.
- 232 5.3 This sample collection method applies to suspicious visible powders that are amassed
233 or dispersed in a limited area where the bulk of the powder sample is in an area that is
234 less than 20 by 20 cm (approximately 8 by 8 in.) or 400 cm² (approximately 64 in²).
- 235 5.4 These practices should only be used to collect samples that are suspected biothreat
236 hazards and that have been field screened according to reference guidance for
237 explosive hazards, radiological hazards, and other acute chemical hazards.
- 238

239 240 6. Summary of Sample Collection Method A



- 241 6.1 A visible powder sample that is a suspected biothreat agent and its source should be
242 field screened for non-biological hazards as defined in the FBI-DHS-HHS/CDC
243 Coordinated Document and according to the reference guidance **including appropriate**
244 NFPA **documents**. Non-biological hazards include explosive hazards, radiological
245 hazards, and chemical hazards. The visible powder sample, amassed or dispersed in a
246 limited area, is collected from a nonporous surface using a swab and a laminated card
247 to move the sample into a sterile dry collection container that is held close to the
248 surface.
- 249 6.2 The method provides guidance on performing these procedures in a manner that will
250 minimize sample loss and aerosolization of the powder. The bulk powder sample and
251 swab are sent to a LRN reference laboratory for confirmatory analysis.
252

253 7. Sampling and Packaging Equipment and Supplies

254

- 255 7.1 Personal Protective Equipment - Level A, B, or C personal protective equipment
256 ensembles as indicated (see Reference section for additional guidance).
- 257 7.2 Clean drop cloth to create a clean work area.
- 258 7.3 *Sample Transport Container*—Bucket or large heavy duty plastic bag.
- 259 7.4 *Non-powdered Nitrile or Vinyl Examination Gloves*.
- 260 7.5 *Two Sterile Polypropylene Wide-mouth Screw-capped Sample Collection Containers*
261 *(Sample Containers)*—Containers must possess a leak-resistant seal; each pre-labeled
262 as “POWDER SAMPLE” with unique sample identifier numbers.
- 263 7.6 *Bleach Solution*—Fresh pH-adjusted bleach solution (household bleach diluted 1:10;
264 pH-adjusted to 6.8-8.0) should be prepared outside of the hot zone just prior to use by
265 (step 1) mixing one part household bleach (5.25 to 6.0 % sodium hypochlorite) with 5
266 parts water (v/v); (step 2) adding 1 part white vinegar; (step 3) adding 3 parts of
267 additional water. A contact time of 15 minutes is needed for treating the outer surface
268 of bagged items or PPE and 60 minutes for decontamination of heavily contaminated
269 objects or water. Treated outer surfaces of bagged items should remain wet when
270 placed in additional containment bags to insure adequate contact times are achieved.
271 Note: Additional information about decontamination is available at
272 www.epa.gov/opp00001/factsheets/chemicals/bleachfactsheet.htm and
273 www.emergency.cdc.gov/agent/anthrax/environment/.
- 274 7.7 *Labeling or marking Tape*.
- 275 7.8 *Solvent-resistant Indelible Marker*.
- 276 7.9 *Sterile Culture Swabs*, (rayon, macrofoam, or polyester) individually packaged and
277 sterile, self-contained in sealed plastic tube, with absorbent material wrapped around
278 one end of a plastic stick, unopened.
- 279 7.10 *Two 4 by 6.5 cm (approximately 1.5 by 2.5 in.) Sterile Plastic Laminated Cards*.
- 280 7.11 *1-gal Self-sealing Plastic Bag(s)*—Bags with sliding lock and Trademark Whirl-Pak⁶
281 bags are not recommended for this purpose due to sealing problems; the use of colored
282 or opaque bags is discouraged because it makes viewing of the sample more difficult
283 once transported back to the laboratory in the CDC Laboratory Response Network.
- 284 7.12 *Two 1-gal Self-sealing Plastic Bags*, pre-labeled as “DRY SWAB” with unique sample
285 identifier numbers.
- 286
- 287 7.13 *1-gal Self-sealing Plastic Bag*, pre-labeled as “PRIMARY SOURCE” with unique
288 sample identifier number.

⁶ Whirl-Pak is a trademark of Nasco International, Inc.



- 289 7.14 *Two 1-gal Self-sealing Plastic Bags*, pre-labeled as “POWDER SAMPLE” with
290 unique sample identifiers.
- 291 7.15 *Bucket*, or other container marked “BIOHAZARD WASTE”.
- 292 7.16 *1-gal Self-sealing Plastic Bag(s)*, pre-labeled as “BIOHAZARD WASTE”.
- 293 7.17 *Field Screening Results Form*—See example in [Appendix X1](#).
- 294 7.18 *Sample Collection Sheet*—See example in [Appendix X2](#). Note that a single sample
295 collection sheet can be used for all items collected at a single location including
296 primary source, swab and powder sample(s).
- 297 7.19 *Chain-of-Custody Form*—See example in [Appendix X3](#).
- 298 7.20 *Two Plastic Transparent Document Pouches*, with adhesive on back.
- 299 7.21 *Durable Hard-sided Outer Container*, with lid or screw cap, for sample transport (such
300 as metal can with lid, or plastic container with lid).
- 301 7.22 Attach documentation described in the Sample Collection and Submission section of
302 ASTM WK 26640. Documentation should include the contact information for local,
303 state, and federal law enforcement, local health officials and local/national testing
304 facilities.
305

306 8. Procedure

- 307
- 308 8.1 Practices employed herein potentially support a criminal investigation directed by the
309 FBI and/or local law enforcement. Additionally these actions should be supported by
310 a written incident action plan and site safety plan developed under the direction of the
311 Incident Commander. A coordinated risk assessment including a hazard and threat
312 assessment should be performed prior to determination of a sampling mission. These
313 practices assume that a sampling site/hot zone has already been defined. These
314 practices are to be performed by personnel who are adequately trained to work with
315 hazardous materials in the hot zone ([NFPA 471](#), [NFPA 472](#), and [29 CFR, Part](#)
316 [1910.120](#)).
- 317 8.2 Prior to entering hot zone for sampling purposes, proper site safety practices should be
318 implemented, including establishing decontamination areas, and assuring that
319 appropriate PPE is selected based on a risk assessment.
- 320 8.3 Prior to performing these practices, review the sampling plan and sampling procedures
321 and assemble all necessary equipment before entering the hot zone. At minimum, a
322 two-person team is required to perform these sampling procedures in the hot zone.
- 323 8.4 Prior to entering the hot zone for sampling purposes, properly label the two sterile
324 plastic sample collection containers. The sample collection containers are the primary
325 containment for bulk dry powder sample and are labeled as “POWDER SAMPLE”
326 with unique sample identifier numbers on each container. Properly label five 1-gal self
327 sealing bags in the following manner: (1) and (2) containment for two dry swabs each
328 labeled as “DRY SWAB” and with unique sample identification numbers; (3) contains
329 the primary containment for source of powder (letter or small package) labeled as
330 “PRIMARY SOURCE” and with a unique sample identifier number; and (4) and (5)
331 containment for two sample collection containers labeled as “POWDER SAMPLE”
332 and with unique sample identifiers.
- 333 8.5 After entering the hot zone, ensure that the sample material is protected from wind
334 currents and moisture until all sampling is completed.
- 335 8.6 Perform basic field screening on material prior to sample collection to assess explosive
336 hazards, radiological hazards, and acute chemical hazards ([NFPA 471](#) and [NFPA 472](#)).
337 Use screening methods to minimize sample consumption, thereby conserving as much
338 of the sample as possible. Ensure that the results of field screening are documented



- 339 indicating which tests have been performed and their outcome (see example of field
340 screening results form in [Appendix X1](#)). In situations where biothreat agents are
341 suspected, the item(s) should be field screened for explosive devices and substances,
342 radiological materials, corrosive materials and volatile organic compounds as defined
343 in the joint FBI-DHS-HHS/CDC Coordinated Document guidelines for responders to
344 suspicious letters and packages.
- 345
- 346 8.7 This instruction is provided for a two-person sampling team to conduct the sampling
347 procedure in the hot zone. The procedure should not be performed if there are fewer
348 than two persons in the hot zone. The first team member (assistant sampler, also
349 known as the facilitator) is responsible for communication, photography ([Handbook of
350 Forensic Services 2003](#)), ensuring that the sample collection sheet is filled out, and
351 facilitating collection (for example, opening and handing materials to the sampler as
352 required, including sample collection containers, gloves, swab, laminated card, other
353 sampling materials, and packaging materials). The second team member (sampler) is
354 the person collecting the sample and should be the only person to come in contact with
355 the suspicious material. The sampler is also responsible for signing the final chain-of-
356 custody form outside of the hot zone.
- 357 8.8 Sampling teams should refer to standard operating procedures regarding the collection
358 of any negative controls (also referred to as field blanks). Negative controls include
359 unopened sampling media and any wetting solutions.
- 360 8.9 All team members put on a new pair of non-powdered nitrile or vinyl examination
361 gloves over the gloves that are part of standard PPE ensemble (that is, team members
362 will have two or three or more layers of gloves on) for each sample collected. Use
363 appropriate aseptic techniques between samplings to minimize cross contamination.
- 364 8.10 *Assistant sampler*—Lay down the clean drop cloth to create a clean work area, and
365 place materials on drop cloth.
- 366 8.11 *Assistant sampler*—Ensure the following items are documented through radio
367 communication between hot and cold zone personnel and finalization of paperwork in
368 the cold zone prior to sending the sample to the laboratory (see example in [Appendix
369 X2](#)).
- 370 8.11.1 Unique sample number or identifier,
371 8.11.2 Sample location and address,
372 8.11.3 Type of sample,
373 8.11.4 Time and date of sample,
374 8.11.5 Names and signatures of persons collecting sample,
375 8.11.6 Measured size of the area sampled, and
376 8.11.7 Map of sample area.
- 377 8.12 *Assistant sampler*—If the source of the powder is present on the surface, and the
378 source is a letter or other small package that can fit easily into a 1-gal self-sealing
379 plastic bag, position the pre-labeled bag labeled as “PRIMARY SOURCE” above the
380 surface next to the source, and hold the bag open.
- 381 8.13 *Sampler*—Place the source gently into the plastic bag. Limited handling of the
382 primary source is recommended to preserve forensic attributes for additional testing.
383 Make sure all writing and markings are visible through the bag.
384
- 385 8.14 *Assistant sampler*—Seal the bag. Place the sealed bag containing the source into
386 another transparent self-sealing bag.
- 387 8.15 *Assistant sampler*—Seal the bag and place into sample transport container for
388 decontamination.



- 389 8.16 *Assistant sampler*—Give laminated card to sampler. Loosen the cap of the tube
390 containing the swab.
- 391 8.17 *Sampler*—Remove the swab from the tube while the assistant sampler holds the tube.
392 Hold the laminated card at an angle on the surface next to the powder. If the surface is
393 smooth, use the card to push the powder into a pile on the surface. Use the sterile swab
394 to gently push the dry powder onto the laminated card. Be sure to use slow, deliberate
395 motions while moving the powder.
396
- 397 8.18 *Assistant sampler*—firmly hold the tube for the sampler
- 398 8.19 *Sampler*- Place swab firmly into tube, taking care not to touch the outside of the tube
399 with the swab.
- 400 8.19 *Assistant sampler*—Open the sample container labeled as “POWDER SAMPLE” and
401 hand the open container to the sampler.
- 402 8.20 *Assistant sampler*—Place the tube containing the swab into a transparent self-sealing
403 bag labeled as “DRY SWAB”. Seal the bag, and place into sample transport container
404 for decontamination.
- 405 8.21 *Sampler*—Hold the sample collection container on its side parallel to the surface and
406 place the laminated card (with the powder on top) into the sample collection container.
407 A second sterile laminated card can be placed on top of the sample, sandwiching the
408 sample between two cards prior to placing both cards in the sample collection
409 container. Do this slowly and gently so as to minimize aerosolization of the powder.
- 410 8.22 *Sampler*—Take the lid from the assistant sampler and place the lid on the sample
411 collection container containing the laminated card and dry bulk powder.
- 412 8.23 *Sampler*—Place the closed, pre-labeled container containing the dry bulk powder into
413 a transparent self-sealing bag held open by assistant sampler. Do not touch the outside
414 of the bag.
- 415 8.24 *Assistant sampler*—Seal the bag and place into sample transport container for
416 decontamination.
- 417 8.25 If the amount of powder is too large to collect it all using a single laminated card and
418 swab, repeat steps 8.15 through 8.24 with a new card, swab, and pre-labeled sample
419 collection container. In situations where significant material is present after the initial
420 sample is collected for the laboratory, the sampling team should coordinate and
421 discuss with the receiving laboratory and FBI the disposition of the residual material.
422
- 423 8.26 If there is residual powder and conditions allow for the team to remain in the hot zone,
424 the team may perform Sample Collection Method B, now, prior to leaving the hot
425 zone.
- 426 8.27 *Assistant sampler*—Rinse or wipe the outside of the sealed plastic bags containing the
427 primary source, powder sample(s), and swab(s) with decontamination solution,
428 without drying the bags, collect the bleach runoff in a container marked
429 “BIOHAZARD WASTE”. The outer surface of the larger sealed plastic bag should be
430 decontaminated using a 10% bleach solution adjusted to a pH of 7 with a 10-minute
431 contact time, as the sealed plastic bag leaves the contaminated area.
- 432 8.28 Sampling team transports all samples out of the hot zone and into the decontamination
433 line in the warm zone.
- 434 8.29 *Assistant sampler*—Place the rinsed, sealed bags containing the primary source,
435 powder sample(s), and swab(s) into separate self-sealing plastic bags and seal.
- 436 8.30 Any unused supplies that were carried into the hot zone (plastic bags, sample
437 containers) should also be placed into “BIOHAZARD WASTE” bag(s).



- 438 8.31 *Assistant sampler and Sampler*—After following all proper personnel decontamination
439 procedures (NFPA 471 and NFPA 472), move the samples to the cold zone. Place the
440 rinsed, sealed bags into a durable hard-sided outer container. Place the lid on the
441 container.
- 442 8.32 *Assistant sampler and Sampler*—Seal the durable outer container. Initial and date the
443 sample package with the indelible marker.
- 444 8.33 *Assistant sampler or Sampler*—Transfer all sample and field screening information to
445 a clean sample collection sheet and field screening results form in the cold zone.
- 446 8.34 *Assistant sampler or Sampler*—Transfer all unique sample numbers or identifiers and
447 other pertinent information from the sample collection sheet onto a chain-of-custody
448 form (see example in Appendix X3).⁷
- 449 8.35 *Assistant sampler or Sampler*—Attach a self-sticking document pouch to the durable
450 outer container. Place the clean sample collection sheet and field screening results
451 form and any additional paperwork or documentation inside the document pouch.
452 Place labeling tape over the opening of the document pouch and initial and date the
453 tape with the indelible marker.
- 454 8.36 *Sampler*—Sign a chain-of-custody form at the receiving area. Hand the package to the
455 person who is responsible for transporting the package (transporter).
- 456 8.37 *Transporter*—Examine the outer package to determine that it is properly packaged and
457 sealed, and that the chain-of-custody form is completed. Sign the original chain-of-
458 custody form. Give one copy of the form to the submitter (sampler) and retain the
459 original form. Place the original signed chain-of-custody form into a second self-
460 sticking document pouch and adhere to the outside of the package. Transport all
461 samples under secure conditions to the predesignated, approved LRN reference
462 laboratory. Any transfers of the materials from one person to another should be
463 documented on the chain-of-custody form with signatures.
- 464 8.38 The primary source, powder sample(s), and swab(s) are transported in a manner that
465 complies with all state and federal regulations (IATA PI 602, IATA PI 650, IATA
466 DGR, 46th Edition, IATA DGR, Addendum I, IATA DGR, Addendum II, IATA
467 DGR, Addendum III, and 49 CFR, Parts 171-180). All materials are maintained under
468 chain of custody in a secure and biosafe area at the LRN reference laboratory until
469 testing is completed.

SAMPLE COLLECTION METHOD B—SWAB SAMPLE COLLECTION FOR ON-SITE ANALYSIS

9. Scope

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476
- 477 9.1 This sample collection method applies to swab sampling of suspected bioterror
478 powders from nonporous surfaces to collect residual powder from Method A. Swab
479 sampling produces a sample that may be used for on-site biological assessments.
- 480 9.2 These practices are performed only after collecting the bulk sample in the hot zone as
481 described in Sample Collection Method A-Bulk Sample Collection.
- 482 9.3 These practices should only be used to collect samples that are suspected biological
483 hazards and that have been field screened for explosive hazards, radiological hazards,
484 and acute chemical hazards.

⁷ Prior to shipping any sample suspected to contain a biological agent, contact your state public health laboratory or nearest laboratory in the national response network (currently the CDC Laboratory Response Network) for specific guidance. Any materials that might be used as evidence in any investigation must be controlled by a chain of custody at all times.



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10. Summary of Sample Collection Method B

- 10.1 A nonporous surface from which a suspicious visible bulk powder, a suspected bioterror agent, has previously been collected is swabbed using a moistened swab to collect any residual powder. The sample may be used for on-site assessments of biological properties. It is recommended that only assays validated according to consensus performance specification standards be utilized in any on-site biological assessments.

11. Sampling Equipment and Supplies for Sample Collection Method B

- 11.1 Personal Protective Equipment—Level A, B, or C as necessary (29 CFR 1910.120 Appendix B and NFPA 1994).
- 11.2 Sample collection tools are the following: (1) sterile culture swab (rayon, macrofoam, or polyester), individually packaged and self-contained in sealed plastic tube, with absorbent material wrapped around one end of a plastic stick, and, if available, (2) sample collection device provided by manufacturer of the on-site biological assessment kit.
- 11.3 Sterile solutions for moistening the swab are as follows: (1) sterile vial with lid, pre-labeled as “BUFFER,” containing minimally 0.5 mL of Phosphate Buffered Saline (PBS) solution with 0.1 % Tween-20⁸; and, if available, (2) buffer solution from manufacturer of on-site biological assessment kit if required by manufacturer. Background control samples of collection materials including buffer solutions utilized in sampling of residual powder should be submitted to the receiving LRN reference laboratory. Any control buffers or materials must be clearly labeled and indicated in submission documentation.
- 11.4 1-gal Self-Sealing Bag—Pre-labeled as “WET SWAB” with unique sample identifier number.
- 11.5 Sample Collection Sheet.

12. Procedure

- 12.1 *Sampler*—The residual powder that remains on the surface following bulk powder sample collection may be used for on-site biological assessments. Follow instructions provided by the manufacturer regarding sample collection for on-site biological assessments using a commercially available kit. Personnel performing on-site biological assessments should be adequately trained in the use of biological assessment technologies (NFPA 472).
- 12.2 *Assistant sampler*—Record the methods and results of on-site biological assessments. Since this sample is consumed for on-site analysis, a chain-of-custody form is not needed.
- 12.3 If there is a significant amount of residual powder remaining on the surface after on-site biological assessment; or if there is significant amount of residual powder on the surface and the team does not have the capability to perform on-site biological

⁸ Tween-20 is a trademark of ICI Americas, Inc.



- 532 assessment, perform Steps 12.4 through 12.11 to collect residual powder for packaging
533 and transport to the receiving LRN reference laboratory.
- 534 12.4 *Assistant sampler*—Remove the lid from the vial labeled as “BUFFER” and hand the
535 vial to the sampler. Loosen swab from tube (but do not remove swab) and hand tube
536 with swab to sampler. Sampler holds the tube and “BUFFER” vial in the same hand.
- 537 12.5 *Sampler*—Remove swab from tube and place into “BUFFER” vial to moisten, using
538 aseptic technique to prevent cross contamination. Press the swab against the side of the
539 vial to remove excess liquid. Remove swab from “BUFFER” vial and drop
540 “BUFFER” vial into biohazardous waste container.
- 541 12.6 *Sampler*—Wipe the swab over the surface where the powder was originally found,
542 using closely spaced vertical S-strokes or Z-strokes over the entire sampling area.
- 543 12.7 *Sampler*—Roll the swab handle (end of the plastic stick furthest from absorbent
544 material) between fingers to rotate the swab, thereby exposing a fresh surface. Wipe
545 the swab over the entire area again, this time using horizontal S-strokes or Z-strokes
546 over the surface. The recommended swab area is <400 cm² (64 in.²).
- 547 12.8 *Sampler*—Place swab into tube, and seal tube by pressing firmly.
- 548 12.9 *Sampler*—Place the closed tube containing the swab into a transparent self-sealing bag
549 labeled as “WET SWAB” held open by the assistant sampler. Do not touch the outside
550 of the bag.
- 551 12.10 *Assistant sampler*—Seal the bag, and place into sample transport container for
552 decontamination.
- 553 12.11 Continue with procedure in 8.27 through to the end of Method A as determined
554 appropriate through correspondence with the receiving LRN reference laboratory.
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13. Keywords

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559 13.1 packaging; sample collection; suspicious powders; swab
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561

APPENDIXES (Nonmandatory Information)

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565 These appendices provide example forms for the user. Use of these specific forms is not mandatory.
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X. Example and Best Practices Forms

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X-1.2 EXAMPLE SPECIMEN SCREENING FORM

MDPH William A. Hinton State Laboratory Institute Biological/Chemical Specimen Submission Form / Environmental Threat		<i>Do not write in this box; SLI use only</i> SLI TRACKING NUMBER (One SLI Tracking # Per Package)
SPECIMEN SCREENING INFORMATION		
SPECIMEN WAS SCREENED FOR: (check any applicable boxes and write additional information if the box is checked)		
<input type="checkbox"/> RADIATION	Screening Method(s): _____ Background Reading: _____ Sample Reading (units): _____	
<input type="checkbox"/> EXPLOSIVES	Screening Method(s): _____ Results: _____	
<input type="checkbox"/> CHEMICALS	<input type="checkbox"/> WMDs Screening Method(s): _____ Results: _____ <input type="checkbox"/> pH Results: _____ <input type="checkbox"/> OTHER Screening Method(s): _____ Results: _____	
<input type="checkbox"/> OTHER	Screening Method(s): _____ Results: _____	
SAMPLE SCREENED BY: <small>(Fill out this section completely)</small>	Technician Name(s): _____ Address: _____	Organization(s): _____ Telephone(s): _____
COLLECTOR/SUBMITTER INCIDENT IDENTIFIER #: _____		
<p align="center">The Hinton State Laboratory Institute does not accept explosive or incendiary material or chemical WMD. Call the 24/7 Laboratory Emergency Cell phone at 617-590-6390 for guidance.</p>		
<small>Questions regarding the submission and analysis of explosive or incendiary material should be referred to the Arson & Explosives Unit at the State Crime Lab 8 am – 5 pm Telephone ~ 508-358-3220 / After Hours Pager ~ 508-899-3770 / After Hours Cell ~ 508-241-2052</small>		

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X2. EXAMPLE OF SAMPLE COLLECTION SHEET

Sample Number or Sample Identifier: _____

Date/Time of Sample: _____

Type of Sample: _____

Description of Material Sampled (e.g., color, texture, homogeneity etc.):

Name of Persons Collection Sample:

Sampler

Printed Name: _____

Signature: _____

Phone Number: _____

Facilitator

Printed Name: _____

Signature: _____

Phone Number: _____

Measured Size of Area Sampled: _____

Sample Location (include agency, address, room number, description of sample location):

Map of Sample Area:

Other Comments:

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X3. EXAMPLE OF CHAIN OF CUSTODY FORM

1. NAME OF SAMPLE COLLECTOR		2. LOCATION OF SAMPLE COLLECTION ADDRESS (CITY, ST, ZIP)			
3. REASON OBTAINED		4. TIME/DATE OBTAINED			
5. ITEM #	6. QUANTITY	7. DESCRIPTION OF SAMPLE (Liquid, Solid, Color, etc)			
8. ITEM #	9. QUANTITY	10. DESCRIPTION OF SAMPLE PACKAGING			
12. ITEM #	13. DATE	14. RELEASED BY	15. RECEIVED BY	16. PURPOSE OF CHANGE OF CUSTODY	17. SHIPMENT DESCRIPTION
		Signature	Signature		
		Print: Name, Grade, Title	Print: Name, Grade, Title		
		Signature	Signature		
		Print: Name, Grade, Title	Print: Name, Grade, Title		
		Signature	Signature		
		Print: Name, Grade, Title	Print: Name, Grade, Title		

FIG. X3.1 Chain of Custody Form



14. ITEM #	15. DATE	16. RELEASED BY	17. RECEIVED BY	18. PURPOSE OF CHANGE OF CUSTODY	19. SHIPMENT DESCRIPTION	
		Signature	Signature			
		Print: Name, Grade, Title	Print: Name, Grade, Title			
		Signature	Signature			
		Print: Name, Grade, Title	Print: Name, Grade, Title			
		Signature	Signature			
		Print: Name, Grade, Title	Print: Name, Grade, Title			
		Signature	Signature			
		Print: Name, Grade, Title	Print: Name, Grade, Title			
		Signature	Signature			
		Print: Name, Grade, Title	Print: Name, Grade, Title			
20. BACKGROUND INFORMATION						
a. Wind Speed	b. Wind Direction (from)	c. Temperature	d. Humidity	e. Visibility	f. Terrain	g. Other Remarks
21. FINAL DISPOSAL ACTION						
RELEASE TO OWNER OR OTHER (Name/Unit)						

DESTROY						

OTHER (Specify)						

22. FINAL DISPOSAL AUTHORITY						
ITEM(S) _____ ON THIS DOCUMENT, PERTAINING TO THE INVESTIGATION INVOLVING						
_____ (Grade)						
_____ (Name) _____ (Organization) _____ (IS) (ARE) NO LONGER						
REQUIRED AS EVIDENCE AND MAY BE DISPOSED OF AS INDICATED ABOVE. (If article(s) must be retained, do not sign, but explain in separate correspondence.)						
_____ (Typed/Printed Name, Grade, Title) _____ (Signature) _____ (Date)						
23. WITNESS TO DESTRUCTION OF EVIDENCE						
THE ARTICLE(S) LISTED AT ITEM NUMBER(S) _____ (WAS) (WERE) DESTROYED BY THE EVIDENCE CUSTODIAN, IN MY PRESENCE, ON THE DATE INDICATED ABOVE.						
_____ (Typed/Printed Name, Organization) _____ (Signature)						

FIG. X3.1 Chain of Custody Form (continued)



X-4.1 EXAMPLE BIOTHREAT TRACKING FORM

New York State Department of Health
Wadsworth Center
Biodefense Laboratory
120 New Scotland Avenue
Albany, NY 12208 Phone (518) 474-4177

Laboratory Response Network
Biothreat Tracking Form

Specimen Information

Incident ID# _____ Collection Date/Time _____
Investigating agency and contact information _____
Collection County _____
Collection Site (address) _____
Targeted Individual's name (if any) _____
Specimen Description _____

Collection Site Information

Building evacuated no [] yes [] details _____
Ventilation system shut down no [] yes [] details _____
Site/building locked-down no [] yes [] details _____
Media on-site no [] yes [] details _____
Medical response initiated no [] yes [] details _____

Credible Biohazard Assessment Criteria

Stated or implied Threat no [] yes [] describe _____
Visible, testable Material no [] yes [] describe _____
Uncertain or suspicious Origin no [] yes [] describe _____
Exposure or illness
Targeted individual no [] yes [] illness [] _____
First responders no [] yes [] illness [] _____
Sample collectors no [] yes [] illness [] _____

Credible Biohazard Assessment performed by _____

Field Hazard Screens performed by _____

Explosive Device negative [] Instrument used _____

Chemical Hazard negative [] Instrument used _____

Rad/Nuc Hazard negative [] Instrument used _____

ALL samples must be NEGATIVE by ALL Screens to be accepted at testing laboratory

Sample Collected by _____

Sample Container Decontaminated by _____

UNYRIC notified (by whom) _____ date/time _____

NYSPIN BIO1 submitted (by whom) _____ date/time _____

Submitter Information

Name _____
Phone () - _____ After hours () - _____ Message OK? yes [] no []

Report Results To (if different than Submitter)

Name _____
Phone () - _____ After hours () - _____ Message OK? yes [] no []

Incomplete information reporting on this tracking form or a failure to conduct hazard screening
procedures as outlined will result in this sample being refused at the laboratory and/or returned to the
submitting agency.

White and Yellow copies to lab Pink copy to law enforcement Blue copy to local health department



X-4.2 EXAMPLE SPECIMEN SUBMISSION FORM

William A. Hinton State Laboratory Institute
Massachusetts Department of Public Health
305 South Street, Jamaica Plain, MA 02130
(617) 590-6390

<i>Do not write in this box; SLI use only</i>	
SLI TRACKING NUMBER <small>(One SLI Tracking # Per Package)</small>	BT LAB NUMBER(S):
Received By Print Name: _____	
Signature: _____	
Date Received: ____/____/____	Time Received: ____ am pm
Priority Sample <input type="checkbox"/> Yes <input type="checkbox"/> No	

Biological/Chemical Specimen Submission Form
Environmental Threat

1	COLLECTOR/SUBMITTER INCIDENT IDENTIFIER #: _____	INCIDENT REPORT ATTACHED? Yes No	EVIDENCE? Yes No	SPECIMEN SCREENED? Yes No (if yes, fill out back of form)
SAMPLE DESCRIPTION: _____				
DATE COLLECTED: ____/____/____ TIME COLLECTED: ____ am pm COLLECTED BY: _____ (print name)				
2	LOCATION WHERE SAMPLE WAS COLLECTED:			
	Location Name: _____	Telephone: _____		
	Address: _____	Fax: _____		
	Contact Name: _____			
3	COLLECTOR INFORMATION:	4 SUBMITTER INFORMATION: <input type="checkbox"/> SAME AS COLLECTOR		
	Contact Name (Lab Report To): _____	Contact Name (Lab Report To): _____		
	Organization: _____	Organization: _____		
	Address: _____	Address: _____		
	Telephone: _____	Telephone: _____		
5	DELIVERY TO STATE LABORATORY INFORMATION:			
	Delivered By (Name): _____	Organization: _____		
	Delivered By (Title): _____	Badge Number: _____		

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