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**Ebola Virus Disease Waste Management
in the Medical Treatment Facility**

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Standing Operating Procedure No. EHE37-001

**Ebola Virus Disease Waste Management
in the Medical Treatment Facility**

Prepared by

**Army Public Health Center (Provisional)
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Aberdeen Proving Ground, MD 21010**

June 2016

This is a guidance document for medical treatment facility (MTF) personnel to revise into a site-specific MTF Ebola Virus Disease Waste Management SOP. Personnel should enter locations, points of contact and other site-specific details to fit the specific MTF location.

Do not alter the procedures, methods and processes for waste handling and decontamination described within this document unless site-specific requirements dictate revisions.

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
SECTION 1 INTRODUCTION	
1.1 Purpose	1
1.2 Regulatory Background	1
1.3 Applicability.....	1
1.4 References	1
1.5 Abbreviations and Terms.....	1
1.6 Contacts	1
1.6.1 Army Public Health Center (Provisional)	1
1.6.2 MTF Preventive Medicine Service.....	2
1.6.3 MTF Infection Control Officer	2
1.6.4 MTF Logistics, Environmental Services Chief/Supervisor	2
1.7 Disinfectants	2
SECTION 2 RESPONSIBILITIES	
2.1 Hospital Commander	3
2.2 Infection Control/Safety	3
2.2.1 PPE	3
2.2.2 Exposure Oversight.....	3
2.2.3 Training	3
2.2.4 Disinfection.....	3
2.2.5 Personal Property	3
2.3 Preventive Medicine	4
2.3.1 Policies.....	4
2.3.2 Funding	4
2.3.3 Oversight.....	4
2.3.4 Training	4
2.3.5 Technical Support	4
2.3.6 Contract Review	4
2.4 Logistics	4
2.4.1 Storage	4
2.4.2 Movement	4
2.4.3 Funding	4
2.4.4 Ebola Virus Disease (EVD) Waste Management	4
2.4.5 Coordination.....	5
2.4.6 Shipping	5

<u>Section</u>	<u>Page</u>
2.5 Patient Care Providers (Clinicians, Nurses, Support Staff.).....	5
2.5.1 Isolation Room Personnel Selection	5
2.5.2 Cleanup and Waste Management.....	5
2.5.3 Initial Treatment Areas	5
2.6 Hand Hygiene.....	5

SECTION 3 WASTE SEGREGATION AND COLLECTION

3.1 Waste Classification	6
3.1.1 Classifications	6
3.1.2 Definition	6
3.1.3 Disinfectants.....	6
3.2 Disposal of Body Fluids	6
3.2.1 Equipment and Supplies	6
3.2.2 Fluid Dump and Flush Procedure.....	7
3.2.3 Patient Flush Procedure.....	8
3.2.4 Liquid Effluent from Laboratory Equipment	9
3.2.5 Patient Shower.....	9
3.3 Collection of Solid EVD Waste	9
3.3.1 General	10
3.3.2 Isolation Room Waste	10
3.3.3 Anteroom Waste	11
3.3.4 Initial Diagnostic Care Area Wastes (Emergency Room, Family Practice, Clinics)	14
3.3.5 Inpatient Care Waste Generated During Three-Day Diagnostic Period	15
3.3.6 Laboratory Waste.....	16
3.3.7 Filters from Dedicated Ventilation Systems/Isolation Rooms	16
3.3.8 Personal Property from EVD Patients	17

SECTION 4 MOVEMENT THROUGH THE MTF

4.1 EVD Waste Collection Cart	18
4.1.1 Dedicated Use.....	18
4.1.2 Cart Specifications	18
4.1.3 Disinfection.....	18
4.2 Approved Movement	19
4.2.1 Designated Routes.....	19
4.2.2 Notification	20
4.2.3 Personal Protective Equipment (PPE)	20
4.2.4 Preparations to Move into Patient Care Areas	20

<u>Section</u>	<u>Page</u>
4.2.5 Handling the Red Bags	20
4.2.6 Lid	20
4.2.7 Movement from Patient Care Areas	20
4.3 Cart Storage	21

SECTION 5 STORAGE AWAITING TRANSPORT/TREATMENT

5.1 Storage Area Requirements	22
5.1.1 Dedicated EVD Waste Storage Area	22
5.1.2 Location	22
5.1.3 Security	22
5.1.4 Hazard Indicators	22
5.1.5 Conditions	22
5.1.6 Storage Time.....	22
5.1.7 Estimated Storage Size.....	23
5.2 Temporary Options.....	23
5.3 PPE Waste Collection in the EVD Waste Storage Area	24
5.4 Outer 55-Gallon EVD Waste Drums	24
5.5 Overpack® Salvage Drums.....	24

SECTION 6 CONTRACT REMOVAL UNDER SPECIAL DEPARTMENT OF TRANSPORTATION (DOT) PERMIT AS UNTREATED EVD WASTE

6.1 Background	25
6.2 DOT-SP 16279 Packaging Requirements	25
6.3 Packaging Steps for Stericycle Transport.....	26
6.3.1 Outer 55-Gallon EVD Waste Drums.....	26
6.3.2 Overpack Salvage Drums	27
6.3.3 Large Articles	28
6.4 DOT Shipping Description	29
6.5 DOT Shipping Papers.....	29
6.6 Training Requirements for Signing Manifests	30
6.7 Required Permit Documents.....	30
6.8 Transport Markings and Labels	30

<u>Section</u>	<u>Page</u>
SECTION 7 ONSITE TREATMENT FOR STANDARD CONTRACT REMOVAL AS TREATED REGULATED MEDICAL WASTE	
7.1 Background	32
7.2 Autoclave Treatment for Routine RMW Transportation	32
7.3 Autoclave Considerations	32
7.3.1 Site Considerations	32
7.3.2 Estimating Treatment Capacity	33
7.4 Autoclave Waste Management.....	33
7.4.1 Autoclavable Waste	33
7.4.2 Equipment.....	33
7.4.3 Collection of Solid EVD Waste	34
7.4.4 Autoclave Waste Management Steps	34
SECTION 8 TRANSPORTATION ON INSTALLATION FROM CLINICS TO HOSPITAL	
8.1 Background	36
8.2 Transport of EVD Waste with Patient	36
8.3 Transport of EVD Waste in Dedicated Waste Transport Vehicle.....	37
SECTION 9 MORTUARY AFFAIRS AND AUTOPSY WASTES	
9.1 EVD Waste Generation from Handling Human Remains	39
9.1.1 PPE.....	39
9.1.2 Equipment and Supplies	39
9.1.3 EVD Waste Management.....	39
9.2 Guidance	39
9.2.1 Centers for Disease Control (CDC).....	39
9.2.2 Occupational Safety and Health Administration (OSHA).....	40
9.2.3 Department of Defense (DOD).....	40
SECTION 10 MANAGEMENT OF SPILLS AND UNCONTROLLED PATIENT RELEASES	
10.1 General.....	41
10.2 Notification.....	41
10.3 Approved Procedures	41
10.4 Designated Spill Responders	41

<u>Section</u>	<u>Page</u>
10.5 PPE	41
10.6 Disinfectants	41
10.7 Isolate the Area	41
10.8 Cleaning Supplies and Equipment.....	42
10.9 Waste Disposal.....	42
10.10 Decontamination Guidance	42

SECTION 11 TRAINING

11.1 General.....	43
11.2 Identification	43
11.3 PPE	43
11.4 Functional Training	43
11.5 Exposure Control Plan.....	44
11.6 Documentation	44
11.7 Infectious Substance Shippers	44

SECTION 12 VEHICLE AND TRANSPORT EQUIPMENT DECONTAMINATION AREA

12.1 Designated Area.....	45
12.2 PPE	45
12.3 Waste Management	45
12.4 Decontamination Procedures	45
12.5 Waste Water Management and Tank Cleaning	45
12.5.1 Mass Casualty Facility Design	45
12.5.2 Disinfection of Collected Waste Water in the Tank(s)	46

SECTION 13 EVD WASTE STORAGE AREA TERMINAL CLEANING AND FINAL PPE WASTE MANAGEMENT

13.1 General.....	47
13.2 Approved Procedures	47
13.3 PPE	47
13.4 Disinfectants	47
13.5 Terminal Cleaning Considerations.....	48
13.5.1 MEDCOM Guidance	48
13.5.2 Terminal Cleaning the EVD Patient Treatment Area.....	48
13.5.3 Time	48
13.5.4 Compatibility.....	48

<u>Section</u>	<u>Page</u>
13.5.5 Area Layout.....	48
13.5.6 Thorough Daily Cleaning.....	49
13.5.7 Removing Protective Coverings	48
13.6 Terminal Cleaning and Decontamination.....	48
13.6.1 Initial Dehydration	48
13.6.2 Surface Cleaning.....	49
13.6.3 Floor Cleaning.....	49
13.6.4 Waste Disposal	50
13.6.5 Ultraviolet Germicidal Irradiation (UVGI)	50
13.6.6 Gas/Vapor Disinfection	51
13.6.7 Terminal Cleaning Record	51
13.6.8 Repair Quarantine.....	51
13.6.9 Clean to Remove Disinfectant Residue.....	51
13.6.10 Final Equipment Cleaning	51
13.6.11 Staff Monitoring	52
13.7 Decontaminating Wastes and PPE.....	52
13.7.1 Equipment and Supplies	52
13.7.2 Terminal Cleaning PPE Decontamination	52
13.7.3 Terminal Cleaning Waste Collection	55
13.7.4 Final Waste Handlers.....	57

APPENDICES

A	REFERENCES	A-1
B	ABBREVIATIONS AND TERMS.....	B-1
C	MARKINGS AND LABELS FOR CONUS HIGHWAY TRANSPORT	C-1
D	APPOINTMENT ORDER TEMPLATE FOR EVD WASTE SHIPPERS	D-1
E	EVD WASTE PACKAGING CHECKLIST	E-1

**STANDING OPERATING PROCEDURE
Ebola Virus Disease Waste Management
in the Medical Treatment Facility**

SECTION 1

INTRODUCTION

1.1 PURPOSE. To assure safe collection, removal, transport, and disposal of Ebola Virus Disease (EVD) waste from all medical treatment facilities (MTFs) generation areas in a manner that is safe to personnel and the environment and in compliance with all applicable regulations.

1.2 REGULATORY BACKGROUND. The U.S. Department of Transportation (DOT) categorizes EVD and any waste generated during care of a patient diagnosed with EVD as a Category A Infectious Substance Affecting Humans. The MTFs must follow all DOT transportation requirements for a Category A Infectious Substance specified in the Title 49 Code of Federal Regulations (CFR), Parts 171-180 for domestic transport. United States medical waste contractors are not authorized to transport this waste. The DOT issues exceptions to these transportation requirements by Special Permit (DOT-SP) only.

1.3 APPLICABILITY. This SOP applies to all personnel assigned, attached, or otherwise employed by the MTF and its supported clinics.

1.4 REFERENCES. Appendix A lists references.

1.5 ABBREVIATIONS AND TERMS. Appendix B defines abbreviations and terms used in this Standing Operating Procedure (SOP).

1.6 CONTACTS. Direct questions pertaining to the content of this SOP to the following:

1.6.1 Army Public Health Center (Provisional) (APHC (Prov)). APHC (Prov) [formerly US Army Public Health Command], Environmental Health Engineering Portfolio, Waste Management Program, 410-436-3651. MTF personnel may request EVD Waste Management training from the APHC (Prov) Waste Management Program Training Team at 410-436-3651/5228.

1.6.2 MTF Preventive Medicine Service: (Fill in local information here)

1.6.3 MTF Infection Control Officer: (Fill in local information here)

1.6.4 MTF Logistics, Environmental Services Chief: (Fill in local information here)

1.7 DISINFECTANTS. Use bleach products containing a 5% or greater sodium hypochlorite concentration or U.S. Environmental Protection Agency (EPA)-registered products, recommended by the U.S. Centers for Disease Control and Prevention (CDC) for use against the Ebola virus, as disinfectants in the MTF. See the EPA List L, *EPA's registered antimicrobial products that meet the CDC Criteria for use against the Ebola Virus*, at <http://www.epa.gov/oppad001/list-l-ebola-virus.html>. A 1:10 solution of bleach consists of 1 part bleach mixed with 9 parts water. The Infection Control (IC) Team will approve all disinfectants and areas/functions for their use. When a reference to use an approved disinfectant appears in this document, it refers to the requirements of this paragraph. The APHC (Prov) published a Technical Information Paper, (Preparing and Measuring High Chlorine Concentration Solutions for Disinfection) that addresses chlorine disinfection solutions. See the APHC (Prov) EVD website for this reference at: <http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>

SECTION 2

RESPONSIBILITIES

2.1 MILITARY TREATMENT FACILITY COMMANDER. The MTF Commander shall ensure that EVD waste is identified and managed according to the policies and procedures provided in this SOP, and ensure that personnel follow applicable regulations and permit specifications. Minimize the number of personnel handling EVD waste, because safe management of EVD waste requires training, discipline, and familiarity with complicated procedures. Designate trained and competent personnel to implement procedures. Appoint and certify select individuals in writing to sign EVD waste shipping papers. See Paragraph 6.6 for authorized shipper training requirements.

2.2 INFECTION CONTROL TEAM. The IC Team is comprised of IC, Safety, Preventive Medicine, Industrial Hygiene, and other applicable subject matter experts. The IC Office will lead this effort. The IC team shall:

2.2.1 PPE. Designate and approve all Personal Protective Equipment (PPE) used for EVD waste management in the MTF. Periodically, visually monitor all personnel (including night shift) on proper PPE use.

2.2.2 Exposure Oversight. Oversee exposure control processes and closely monitor personnel for exposures.

2.2.3 Training. Develop hands-on training to provide designated personnel with practice training on: donning PPE, doffing PPE and waste collection in each applicable area (wards, clinics, EVD waste storage, cart disinfection, and so forth). Train personnel on the proper use (donning and doffing) of PPE, waste collection, equipment disinfection, and movement routes through the MTF.

2.2.4 Disinfection. Designate disinfection areas for equipment, and develop hands-on training to provide applicable personnel with disinfection practice training on cart disinfection, equipment disinfection, emergency vehicle disinfection, and so forth.

2.2.5 Personal Property. Develop a procedure to disinfect personal property from EVD patients. Determine which personal property will be disposed as EVD waste and which property will be returned to the patient (see Paragraph 3.3.8).

2.3 PREVENTIVE MEDICINE SERVICES. Preventive Medicine Services personnel will:

2.3.1 Policies. Develop local EVD waste management policies based on local requirements by governing authorities.

2.3.2 Funding. Submit funding requirements for EVD waste disposal to the U.S. Army Medical Command (MEDCOM) Environmental Compliance Program Office.

2.3.3 Oversight. Monitor all phases of EVD waste management including collection, storage, transportation, treatment, and disposal.

2.3.4 Training. Provide technical advice and training to applicable personnel on this SOP (see Section 11).

2.3.5 Technical Support. Support Logistics with site assessments, storage capacity determinations, decontamination locations, EVD waste storage area requirements, and procurement support.

2.3.6 Contract Review. Review and support contract proposals and specifications pertaining to EVD waste management and EVD patient transport services.

2.4 LOGISTICS. Logistics personnel will:

2.4.1 Storage. Establish a dedicated storage area for EVD waste storage that is secured and segregated from other biomedical waste. Designate personnel to manage and control the EVD waste storage area.

2.4.2 Movement. Coordinate with IC, Safety, Facility Management, Preventive Medicine (Industrial Hygiene and Environmental Health) and all other applicable parties to establish designated movement routes through the facility for EVD waste.

2.4.3 Funding. Notify the Preventive Medicine Environmental Science and Engineering Officer of projected funding requirements for the collection, storage, transportation, and disposal of EVD waste.

2.4.4 EVD Waste Management. Arrange for and supervise the collection, storage, transportation, and disposal of EVD from all areas generating EVD waste. Designate personnel to manage the movement of EVD waste from the generation sites through the MTF to the EVD waste storage area. Check housekeeping contracts to

verify existing contracts cover all medical waste management, including Category A Infectious Substances. If not, modify contracts or designate civilian/military staff for this function.

2.4.5 Coordination. Contact the MEDCOM ACSLOG (G44), Program Manager, Environmental Services (Mr. Allan R. LaViers 210-221-6701) and the supporting regional contracting office to issue an immediate task order for EVD waste disposal support.

2.4.6 Shipping. Select properly trained personnel to sign shipping papers (see Paragraph 6.5) and obtain formal appointments from the commander to sign the shipping papers.

2.5 PATIENT CARE PROVIDERS (CLINICIANS, NURSES, SUPPORT STAFF). All personnel will follow waste management segregation and management procedures specified in this SOP to safely handle, decontaminate, package, and remove waste from the MTF.

2.5.1 Isolation Room Personnel Selection. Supervisors of isolation room/anteroom areas will select and designate personnel to conduct EVD waste segregation, collection, and disposal procedures (see Section 3) in conjunction with the IC Team. Supervisors will also select personnel to assist and monitor removal of PPE and placement into EVD waste bags. They may be the same or different people as those designated to perform actual EVD waste collection in the isolation rooms and anterooms.

2.5.2 Cleanup and Waste Management. Clinical personnel will manage EVD waste cleanup (body fluids and solid wastes) in the isolation room areas and manage all cleanup materials as EVD waste according to the procedures in this SOP.

2.5.3 Initial Treatment Areas. Supervisors of areas where an initial patient contact and diagnosis will occur (emergency room, clinics, family practice, laboratory, and so forth) must designate personnel to don/doff PPE and manage the EVD waste generated. They will ensure all designated personnel receive preparatory training.

2.6 HAND HYGIENE. Hand hygiene is fundamental in protecting workers from infection/disease. The MTF personnel must perform hand hygiene frequently, including before and after all patient contact, contact with potentially infectious EVD material, before putting on PPE, and after removal of PPE including gloves. Hand hygiene supplies must be readily available at all applicable areas. This should include both soap and water stations, as well as an abundance of hand sanitizers.

SECTION 3

WASTE SEGREGATION AND COLLECTION

3.1 WASTE CLASSIFICATION.

3.1.1 Classification. Wastes generated from EVD patients are classified as a Category A Infectious Substance due to the highly infectious characteristics of the waste. This classification is more stringently regulated than routine medical waste generated during normal patient care in the facility. Therefore, all waste generated from EVD patient care will be classified as EVD waste and must be kept separate from other regulated medical waste (RMW) generated in the MTF.

3.1.2 Definition. EVD waste includes urine, feces, vomit, and other body fluids; materials containing body fluids; and any items generated during patient care that are disposed instead of disinfected for reuse, including PPE.

3.1.3 Disinfectants. Use EPA-registered, hospital approved disinfectants (see Paragraph 1.7). The IC Team will approve all disinfectants and areas/functions for their use.

3.2 DISPOSAL OF BODY FLUIDS. Liquid wastes may be disposed of in the sanitary sewer as prescribed below.

3.2.1 Equipment and Supplies. Bleach is the best choice disinfectant for wastewater treatment plant (WWTP) purposes; however, the IC Team may select any approved disinfectant per Paragraph 1.7 for use. Note: do not use bleach and disinfectants that are incompatible with bleach at the same time.

- PPE
- Clorox[®] Bleach – off the shelf 5% or greater sodium hypochlorite. (Clorox[®] is a registered trademark of The Clorox Company.) or approved disinfectant per Paragraph 1.7
 - Diluted bleach solutions should be prepared no more than 24 hours in advance to prevent loss of potency over time
 - A 1:10 bleach solution/approved disinfectant in a spray bottle for outer surfaces
 - A straight bleach solution (or undiluted disinfectant) in a container for use directly in the toilet
- Receptacle for waste
- Disposable commode bucket liners as necessary

- Bedside commode as necessary
- Disposable patient underpad or other absorbent covering
- Red bags meeting ASTM specifications (see Paragraph 3.3.1.1)
- Trash cans lined with red bags
- Disinfectant wipes—approved for use in EVD patient care areas
- Clock or timing device to monitor contact time

3.2.2 Fluid Dump and Flush Procedure. This procedure is for waste not excreted directly into the toilet by the patient. Apply this procedure in any location where an EVD patient excretes liquid wastes into a collection vessel other than a fixed toilet. Disable auto-flush toilet valves to ensure manual flushing only.

1. Proceed to designated area and don PPE according to MTF procedure for PPE in isolation rooms for EVD patients.
2. Cover receptacle (bedpan, collection container) with disposable patient underpad or similar covering as needed to prevent spills.
3. Remove the receptacle containing the waste from the patient area to the patient's lavatory.
4. Apply straight bleach (5%) or undiluted disinfectant solution around the bowl in the same manner as liquid/gel toilet bowl cleaner (i.e. apply to the inside top of the bowl and allow to run down into the bowl). Use one cup of bleach/disinfectant.
5. Empty waste into toilet and lower toilet lid. If toilet lacks a lid, place a barrier over it.
6. Allow 15 minutes of contact time then flush toilet.
7. After flush, apply 1:10 bleach solution/approved disinfectant with a spray bottle to other surfaces of the toilet (seat, handle, lid, inside bowl, outside of bowl, back, etc.).
8. Wipe the surfaces with a wipe/cloth to ensure complete surface contact. The purpose of the wipe is to spread the disinfectant evenly and can be any type of wipe available that is compatible with the disinfectant used. Dispose of the used wipe in the EVD waste container (See Paragraph 3.3).
9. Dispose of empty waste container and patient underpad in the EVD waste container (see Paragraph 3.3)

10. Dispose of PPE in the EVD waste container according to EVD solid waste procedures in Paragraph 3.3.

3.2.3 Patient Flush Procedure. This procedure is for waste excreted directly into the toilet by the patient. Apply this procedure in any location where an EVD patient excretes liquid wastes into toilet. Disable auto-flush toilet valves to ensure manual flushing only.

1. Place two containers of bleach in the restroom—one to clean the bowl (straight bleach/undiluted approved disinfectant) and a spray bottle for other surfaces (1:10 solution of bleach/approved disinfectant).
2. Instruct the patient not to flush the toilet after use.
3. After patient use, staff in appropriate PPE will apply bleach/approved disinfectant solution around the bowl in the same manner as liquid/gel toilet bowl cleaner. Use one cup of bleach/disinfectant.
4. Lower toilet lid. If toilet lacks a lid, place a barrier over it.
5. Allow 15 minutes of contact time then flush toilet.
6. After flushing, open toilet lid and apply bleach solution with a spray bottle to other surfaces of the toilet (seat, handle, inside bowl, outside of bowl, back, and so forth).
7. Wipe the surfaces with a suitable disinfectant wipe to ensure complete surface contact. The purpose of the wipe is to spread the disinfectant evenly and can be any type of wipe available that is compatible with the disinfectant used. Dispose of the used wipe in the EVD waste container (See Paragraph 3.3).
8. Dispose of PPE in the EVD waste container according to EVD solid waste procedures in Paragraph 3.3.

3.2.4 Liquid Effluent from Laboratory Equipment. Use of automated lab equipment that produces liquid effluents may be required for patient care. For treatment prior to disposal, discharge the waste into a container with straight bleach pre-added to the container. Allow 15 minutes contact time and pour down the drain. Pour an equivalent amount or more of water down the drain after the waste to remove the bleach odor and prevent corrosion around the drain. All personnel who are managing the collection and discharging of the bleached waste must have appropriate PPE as directed by IC. If the collection container is an integral part of the lab equipment, disinfect with approved disinfectant and contact time (specified by IC) and allow to air dry prior to reuse.

3.2.5 Patient Shower.

1. Just prior to patient entering the shower, apply to the shower floor drain three tablespoons of granular calcium hypochlorite (65–70% available chlorine). This is a widely available (and inexpensive) swimming pool water treatment chemical. Store the granular calcium hypochlorite in an airtight container to avoid contamination by moisture. This amount should not clog the drain or cause a tripping hazard but will stay in the drain until the shower water starts, whereas liquid bleach would quickly flow down the drain.

2. Immediately after the shower, apply one cup of bleach (5% sodium hypochlorite) to the shower floor drain.

3. After the shower, apply 1:10 bleach solution or an approved disinfectant with a spray bottle to shower surfaces, wipe the surfaces with a wipe/cloth to ensure complete surface contact. The purpose of the wipe is to spread the spray and can be any type of wipe available that is compatible with the disinfectant used. Dispose of the used wipe in the EVD waste container (See Paragraph 3.3). Note: do not use bleach and disinfectants/disinfectant wipes that are incompatible with bleach at the same time.

3.3 COLLECTION OF SOLID EVD WASTE. Contract removal is the primary disposal choice for EVD waste generated in the United States. Consequently, many of these collection and segregation steps incorporate guidance issued by the DOT and Stericycle® for transport and disposal of EVD waste under special permit requirements (see Section 6 for DOT special permit details). Failure to meet the requirements could prohibit contracted waste disposal from the MTF.

3.3.1 General.

3.3.1.1 Red Bags. All red bags used to collect EVD waste will be leak-proof, puncture resistant, red plastic bags. Title 49 CFR Section 173.197(e)(1)(i) requires that bags used for transport be marked and certified by the manufacturer to meet the 165 g Impact Strength ASTM[®] D 1709-01 and 480 g Tear Strength ASTM D 1922-00a standards. (ASTM[®] is a registered trademark of the American Society for Testing and Materials.). The DOT special permit for EVD waste transport (see Section 6) also requires both red bag test standards (ASTM D 1709 and 1922).

3.3.1.2 Disinfectants. Use EPA-registered, hospital approved disinfectants (see Paragraph 1.7). The IC Team will approve all disinfectants and areas/functions for their use.

3.3.1.3 Removal from Room. Designated personnel (clinical care providers) will remove waste from the patient's room at least every three hours or when the biohazard waste container is 2/3 full, whichever comes first. Sharps containers must be changed out when they are 2/3 full or when the manufacturer's indicated "full line" is reached, whichever comes first.

3.3.1.4 PPE. Selection and use of PPE in all areas will comply with hospital IC standards for EVD treatment. All personnel handling wastes and/or monitoring waste management will wear approved PPE specified by the IC Team.

3.3.1.5 Segregation. Manage waste collected from EVD patients and suspected EVD patients separately from all other patient care wastes.

3.3.1.6 Handling. Only pickup bags by the neck and never throw or compress the bags. Do not carry a bag over the shoulder where it could drip and create an exposure. Carry the bag by the neck of the bag and away from your own body. Do not drag bags on the floor.

3.3.2 Isolation Room Waste. All solid waste generated in the isolation room will be disposed as EVD waste using the following steps:

1. Line trash cans/waste receptacles with approved red bags.
2. Place all waste in either red bags or sharps containers, as appropriate.
3. Fill red bags to 2/3 capacity. Note: capacity depends on the red bag size. Do not overfill to the point the red bag will not fit in the EVD waste drum.

4. Do not compact bags.
5. Place sharps containers in approved red bags when changed out for disposal.
6. Prior to removal from the room, spray a 1:10 bleach solution or an approved disinfectant into the primary red bag to sufficiently cover the surface of materials contained in the bag. If a sharps container is in the red bag, sufficiently cover the exterior of the sharps container.
7. Balloon tie, tape, or zip tie (required by the DOT-SP) the red bags to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted). The closure method must not tear, puncture or otherwise damage the bags.
8. While holding the red bag over the container it was in, treat the exterior of the primary bag with the bleach solution/disinfectant. If it was not in a container or is too heavy, place an absorbent pad down to capture drips from the sprayed bag, place the bag on the pad and spray. Dispose of the absorbent pad as EVD waste.
9. Move primary red bag to anteroom for secondary red-bagging.

3.3.3 Anteroom Waste. An anteroom is a room specifically designated for entrance and exit from the patient isolation room where staff members can don and doff PPE. The CDC recommends using separate rooms for donning and doffing (removing) PPE. Therefore, collect PPE waste in the area designated for PPE doffing.

3.3.3.1 Dedicated Collection Cart. An enclosed, leak-proof cart as defined in Section 4 must be prepositioned to collect secondary red bags from the anteroom. An exception exists if your MTF completes the packaging by putting the secondary red bags directly into an EVD waste drum (see Paragraph 6.2 for drum specifications). Staff may transport sealed and disinfected, 55-gallon, EVD waste drums through the hospital/clinics with flat carts, hand trucks, or other carts such as linen carts (see Section 4).

3.3.3.2 Secondary Red-Bagging of Primary Red Bags From Isolation. Move tied, primary, red bags removed from the isolation room to the anteroom for secondary red-bagging only after they are sprayed with disinfectant according to Paragraph 3.3.3.2. Conduct secondary red-bagging using the following steps:

1. Line a large trash can/waste receptacle with an approved red bag. This bag will become the secondary red bag.
2. Place primary bag into secondary bag and balloon tie, or tape, or zip tie (required by the DOT Special Permit) the red bags to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted). The closure method must not tear, puncture or otherwise damage the bags.
3. Remove the bag from the trash container and while holding the bag over the trash container, treat the exterior of the secondary bag with an approved disinfectant/1:10 bleach solution. Allow the disinfectant to air dry. If necessary, set the red bag on an absorbent pad to capture drips off the bag—do not spray more disinfectant than necessary to lightly mist the bag. Dispose of the absorbent pad as EVD waste.
4. Mark the secondary red bag with the words “EVD Waste” using a label, printed paper, tie tags etc.
5. Place the disinfected secondary red bag into the collection cart. The bag may now be moved through the MTF to the EVD waste storage area unless your MTF intends to complete the packaging by putting the secondary red bags directly into an EVD waste drum (if so, this step is not necessary – continue to Paragraph 3.3.3.4 for EVD waste drum packaging steps).

3.3.3.3 Collection of PPE and Other Waste Generated in the Anteroom-Complete Double-Bagging Procedure. Waste generated in the anteroom must also undergo a double red bag procedure. Each time the staff changes PPE, multiple bags of waste will be generated so prepare to manage more than one red bag using the following steps:

1. Designate a person(s) to assist with collection of PPE as staff members doff their PPE and exit the treatment area.
2. Line a large trash can/waste receptacle with an approved red bag. This bag is the primary red bag.

3. Place all PPE and other EVD wastes generated in the anteroom in the primary red bag. If a sharps container is used in the anteroom, place it in the red bag when removed for disposal.

4. Spray a 1:10 bleach solution or an approved disinfectant into the primary red bag to sufficiently cover the surface of materials contained in the bag. If a sharps container is in the red bag, sufficiently cover the exterior of the sharps container.

5. Balloon tie, tape, or zip tie (required by the DOT-SP) the red bags to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted). The closure method must not tear, puncture or otherwise damage the bags.

6. Remove the primary bag from the trash container and while holding the bag over the trash container, treat the exterior of the primary bag with an approved disinfectant/1:10 bleach solution.

7. Reline the large trash can/waste receptacle with an approved red bag. This bag is the secondary red bag.

8. Place primary red bag into secondary red bag.

9. Balloon tie, tape, or zip tie (required by the DOT-SP) the secondary red bag closed to prevent the release of material from the bag when inverted.

10. Remove the secondary bag from the trash container and while holding the bag over the trash container, treat the exterior of the secondary bag with an approved disinfectant/1:10 bleach solution. Allow the disinfectant to air dry. If necessary, set the red bag on an absorbent pad to capture drips off the bag—do not spray more disinfectant than necessary to lightly mist the bag. Dispose of the absorbent pad as EVD waste.

11. Mark the secondary red bag with the words “EVD Waste” using a label, printed paper, permanent marker, tie tags, etc..

12. Place the disinfected secondary red bag into the collection cart for movement through the MTF to the EVD waste storage area unless treatment area staff members plan to completely package the waste into the EVD waste drum and seal it for safe transport. Continue to Paragraph 3.3.3.4 for drum packaging guidance.

3.3.3.4 Packing the Outer 55-Gallon EVD Waste Drum. The DOT-SP 16279 requires packaging of red-bagged waste into an approved outer 55-gallon drum (see Paragraph 6.2 for drum specifications). Treatment area staff may choose to package waste red bagged according to Paragraphs 3.3.3.2 and 3.3.3.3 directly into the drum at the treatment location in lieu of transport to the EVD waste storage area for packaging. In this case, once treatment area personnel complete the steps in Paragraph 3.3.3.3, they must follow the steps in Paragraph 6.3.1 to complete the EVD waste drum packaging requirements.

3.3.4 Initial Diagnostic Care Waste (Emergency Room, Family Practice, Clinics, Inpatient Care). Patients may arrive at the clinics or the MTF with exposure histories and symptoms relevant to EVD that after diagnoses are not EVD, but are other illness such as malaria, influenza, reaction to medication, etc. When medical personnel suspect a patient has EVD, they will enact EVD precautions including EVD waste management until they achieve a final diagnosis. A positive EVD diagnosis can require an average of three inpatient treatment days to allow for confirmatory testing and patient observation. Two potential waste classifications will result from final diagnosis: 1) confirmed EVD waste or 2) routine RMW. During the three days that the diagnosis is unconfirmed, clinic or routine treatment area personnel can implement the additional interim waste management procedures in Paragraph 3.3.5 in lieu of completing the final packaging steps in the EVD waste drum (Paragraphs 3.3.3.4 and 6.3.1).

3.3.4.1 Routine Patient Care Areas. When initial EVD patient treatment is in a routine patient care area, establish a separate collection container and segregate all suspected EVD wastes into that container. If possible, hold the suspected waste in the area until a lab performs an EVD identification test, or a Doctor confirms the patient does not have EVD. If the clinic/treatment area cannot hold the waste in the initial treatment area, collect and manage the waste according to Paragraphs 3.3.3.3 and 3.3.3.4. During the three days that the diagnosis is unconfirmed, clinic or routine treatment area personnel can implement the additional interim waste management procedures in Paragraph 3.3.5 in lieu of completing the final EVD waste drum packaging steps in Paragraphs 3.3.3.4 and 6.3.1.

3.3.4.2 Negative EVD Diagnosis. After a confirmed non-EVD diagnosis, reclassify all collected wastes from the suspected EVD patient to RMW and manage according to routine RMW procedures. Remove the tie tags, labels, or papers used to mark the secondary red bags with the words "EVD Waste". If personnel packaged the waste into EVD drums, remove it from the drums and place the red-bagged waste into the standard RMW containers.

3.3.4.3 Positive EVD Diagnosis. After a confirmed positive EVD diagnosis, collect and manage the waste according to Paragraphs 3.3.3.3 and 3.3.3.4 and then move it to a dedicated EVD waste storage area.

3.3.4.4 Transport to the MTF. See Section 4 for EVD waste transportation within the MTF to the EVD waste storage area. See Section 8 for EVD waste transportation from the clinics to the MTF EVD waste storage area.

3.3.5 Inpatient Care Waste Generated During Three-Day Confirmation Period. During the three days that the diagnosis is unconfirmed, treatment area personnel can implement the additional interim waste management procedures in this Paragraph in lieu of completing the final EVD waste drum packaging steps in Paragraphs 3.3.3.4 and 6.3.1. These steps enable personnel to downgrade suspected EVD waste to RMW without additional handling and exposure. These procedures will end after a confirmed positive or negative EVD diagnosis.

3.3.5.1 RMW Totes/Tubs. Dedicate a supply of the Stericycle reusable RMW totes/tubs with lids (normally used for RMW) for EVD waste accumulation. If used for positive EVD patient waste, do not place the totes/tubs back into use for RMW until properly disinfecting them during the terminal cleaning process (see Section 13).

3.3.5.2 Three-Day Hold Procedure. After the EVD waste is double red-bagged, disinfected/bleached, and tied according to steps in Paragraph 3.3.3.3:

1. Place the red-bagged waste into an RMW tote/tub and close the lid. One tote will hold approximately 2 – 3 tied, double red bags.
2. Mark the outside of each tote/tub with the words “EVD waste”, a date, and a link to the patient such as treatment room number, sequential order of the number of patients - #1, 2, 3, etc. Use a labeling method that personnel can easily remove such as duct tape, labels, etc.
3. If the onsite treatment laboratory comingles specimen wastes from all suspected EVD patients, mark the tote with “Lab” to indicate it came from the EVD laboratory. One positive patient will make all red-bagged lab waste positive if comingled.
4. Transport the sealed totes/tubs to the EVD waste storage area and hold until the final diagnosis.
5. Position the totes in the EVD waste storage area according to date and

patient ID for ease of follow-up packaging as EVD waste or downgraded RMW.

6. If a patient is positive, don IC approved PPE, take the red bags out of the tubs, and complete the drum packing procedure (see Paragraph 6.3.1) in the EVD storage area.

7. If the patient is negative, remove the EVD label on the tote/tub and transfer the waste to the RMW storage area. Remove the tie tags, labels, or papers used to mark the secondary red bags with the words "EVD Waste". Dispose of the waste as routine RMW.

8. Hold totes/tubs from positive patients in the EVD storage area until personnel disinfect them. After disinfection, return them to the RMW tote/tub supply area.

3.3.6 Laboratory Waste. Laboratory specimen waste (e.g., blood tubes, sharps, urine cups) from EVD patients must be collected separately from all other RMW in dedicated red bags or sharps containers.

3.3.6.1 Label. Label the sharps container or red bag with the words "EVD Waste".

3.3.6.2 Segregate. Do not place other routine lab specimen wastes in the EVD waste container.

3.3.6.3 Waste Removal. When it is time to remove the waste from the lab, the waste must undergo the same double red-bagging procedure specified in Paragraph 3.3.3.3 (Collection of PPE and Other Waste Generated in the Anteroom). Once properly double red-bagged, move the EVD waste to a dedicated EVD waste storage area.

3.3.7 Filters from Dedicated Ventilation Systems/Isolation Rooms. Isolation areas typically have specially designed negative pressure ventilation units with filters.

3.3.7.1 Supply Side Filters. Filters from the supplied air side will be disposed of as solid waste because they only filter outside air prior to the patient care area.

3.3.7.2 Exhaust Side Filters. Filters from the exhaust air side or from portable filtration units (if they have them) will be disposed of as EVD Waste after positive EVD patient treatment. The filters must undergo the double red bagging procedure in Paragraph 3.3.3.3 (Collection of PPE and other Waste Generated in the Anteroom) and then be moved to a dedicated EVD waste storage area. Special handling may be required based on the size of the filters:

1. Evaluate the filter size to see if it will fit into the outer 55-gallon EVD waste drum without modifying it in any way. If it does, double red bag per Paragraph 3.3.3.3 and manage according to Sections 4, and 5. The best way to evaluate this would be to use a clean filter to test the fit.
2. If the filter size is too large to fit in the DOT approved EVD waste drum, manage according to the large item packaging specifications in Section 6.

3.3.8 Personal Property from EVD Patients.

3.3.8.1 Background. Patients admitted to the hospital place their personal property such as wallet, purse, clothing, and so forth in a plastic bag. Personnel secure the property in the room or a designated location until they release the patient to return home. Staff must quarantine a patient's personal property if they suspect the patient has EVD.

3.3.8.2 Decision to Disinfect or Dispose. The IC Team will decide what personal property items to disinfect and return to the patient and what to items to dispose of as EVD waste. Money, passports and many important documents can be autoclaved safely at 272 degrees Fahrenheit for 10 minutes. Plastic identifications (IDs) and other non-porous items can be submerged in bleach/approved disinfectant. Electronics (phones and cameras) require additional special disposal techniques and may not survive disinfection.

3.3.8.3 Items Selected for Disposal. Manage all untreated items selected for disposal with the EVD waste generated during the patient's care according to Paragraphs 3.2 and 3.3.

3.3.8.4 Items Selected for Disinfection. The APHC (Prov) has published a Technical Information Paper, (Handling Personal Effects from Ebola Infected Patient) that addresses disinfection of personal property. See the APHC (Prov) EVD website for this reference at:
<http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>

SECTION 4

MOVEMENT THROUGH THE MTF

4.1 EVD WASTE COLLECTION CART.

4.1.1 Dedicated Use. Dedicate a cart(s) strictly to the movement of EVD waste throughout the facility. Do not put RMW bags or any other type of waste into the cart. Label the cart with the words "EVD Waste".

4.1.2. Cart Specifications.

4.1.2.1 Moving Red-Bagged EVD Waste. Choose a cart(s) to transport EVD waste that is constructed of a non-porous, readily cleanable material; plastic; or stainless steel. The cart will be equipped with a lid. Keep the lid closed when transporting EVD waste through the MTF. If the EVD waste is in a small clinic, staff can utilize a trash can with a lid as the transport cart. Size the cart to allow easy loading, unloading, and cleaning. Attach a spill kit for EVD waste to the cart.

4.1.2.2 Moving Drummed EVD Waste. Cart specification exceptions exist for movement of completely sealed outer EVD waste drums packaged according to Paragraph 6.3.1. Staff may transport sealed and disinfected, 55-gallon, outer EVD waste drums through the MTF/clinics with flat carts, hand trucks, or other carts such as linen carts. Secure the drums to prevent movement, damage, or spills during transport.

4.1.2.3 Moving Unconfirmed EVD Waste in RMW Totes/Tubs. Choose a cart(s) to transport potential EVD waste secured in RMW totes/tubs. The cart will be constructed of a non-porous, readily cleanable material; plastic; or stainless steel. A lid is not required if personnel secure the tote/tub lids, but is preferred. If the EVD waste is in a small clinic/initial treatment area, staff can use a hand truck. Size the cart to allow easy loading, unloading, and cleaning. Secure the totes/tubs to prevent movement, damage, or spills during transport. Attach a spill kit for EVD waste to the cart.

4.1.3 Disinfection.

4.1.3.1 Cart Disinfection. Disinfect the cart with a 1:10 bleach solution or an EPA-registered, hospital approved disinfectant (see Paragraph 1.7). Thoroughly disinfect the cart using spray or wipe methods on the outside and inside of the cart. Wipe down the entire cart, paying special attention to all surfaces in touch with the EVD waste bags and contact surfaces touched to move the cart. Allow the cart interior to air

dry before closing the lid. Disinfect the cart after each waste movement to the EVD storage area is completed.

4.1.3.2 Disinfection Location. Conduct disinfection in an area specified by logistics and approved by the IC Team. Secure the area to prevent access by unauthorized personnel during disinfection. Remove materials or supplies in the immediate disinfection area except the materials and supplies necessary to disinfect the EVD waste cart. An emergency eyewash device must be located near the cart cleaning area; the device must be functional and maintained according to American National Standards Institute (ANSI) Z358.1-2009, American National Standard for Emergency Eyewash and Shower Equipment, and Department of the Army Pamphlet (DA Pam) 40-506 (The Army Vision Conservation and Readiness Program).

4.1.3.3 PPE. Personnel who clean the cart and/or transport EVD waste in the cart must wear PPE. Selection, use, and donning/doffing locations for PPE will adhere to hospital IC standards for EVD as specified by the IC Team.

4.1.3.4 Spills. Clean spills immediately (see Section 10) with a 1:10 bleach solution or an EPA-registered, hospital approved disinfectant (see Paragraph 1.7). Provide IC with the location of the spill. Perform additional disinfection if directed by IC depending on the spill location. Manage spill cleanup materials as EVD waste according to Sections 3, 4, and 10.

4.1.3.5 Cart Disinfection Waste. Manage cart disinfection waste as EVD waste. Equip the disinfection area with the supplies and equipment necessary to perform the double red-bagging procedure in Paragraph 3.3.3.3. If preferred, position an outer 55-gallon EVD waste drum in the disinfection area to seal the disinfection wastes. Once the drum is sealed, transport it to the EVD waste storage area. Do not move the drum to the storage area without performing the notification step (see Paragraph 4.2.2) and donning proper PPE to enter the EVD waste storage area.

4.2 APPROVED MOVEMENT

4.2.1 Designated Routes. Designate movement routes from isolation units, laboratories, and applicable initial patient care areas to the EVD waste storage area. Avoid high traffic areas or divert other traffic while the EVD waste is in movement through the area. Use freight elevators if possible. Only move EVD waste through the facility using designated routes.

4.2.2 Notification. Personnel transporting the cart must notify Chief, Environmental Services, or Environmental Services supervisor on duty, **(list phone # here)** of impending transport of EVD waste to the storage area to arrange for access to the storage area.

4.2.3 PPE. Wear appropriate PPE (determined by IC) to handle EVD waste, transport EVD waste to the EVD storage area, and move the EVD waste cart to the cart disinfection area. The IC Team will determine appropriate PPE levels for waste movers based on the packaging status (red bags verses sealed drum) and the duties performed by the waste handlers.

4.2.4 Preparations to Move into Patient Care Areas. Put on PPE. If the cart is stored in the disinfection area or a separate clean area, disinfection is not required prior to the next use. If the cart is stored in the EVD waste storage area, wipe/spray the outside of the cart with approved disinfectant prior to moving the cart into the MTF for waste pickup, paying special attention to all contact surfaces touched to move the cart. Place the disinfectant wipes in the EVD waste container positioned in the EVD storage area (see Paragraph 5.3).

4.2.5 Handling the Red Bags. Carefully place bags into the cart. Only pick up bags by the neck and never throw or compress the bags. Do not pick up a bag unless it is properly bagged and marked as EVD waste at the generation site.

4.2.6 Lid. Close the lid on the cart prior to moving from the generation site. Do not overfill the cart with EVD waste to the point where the lid will not close. The cart lid will be kept closed at all times (except when adding/removing waste, undergoing disinfection, or when air drying after disinfection). The lid should be able to close without compressing the waste.

4.2.7 Movement from Patient Care Area. Wipe/spray the outside of the cart with approved disinfectant prior to moving the cart from the patient care area to the storage area. Place the disinfectant wipes in a red bag and hand the red bag to an assisting person (wearing proper PPE) in the anteroom for placement into the anteroom EVD waste bag. During movement, security or posted escorts will close public areas until cart movement is complete. When necessary, wipe floors with a disinfectant mop. Transport the EVD waste in the cart directly from the patient care area to the EVD waste storage area and unload. Once unloaded, move the cart to the designated disinfection area and disinfect according to Paragraph 4.1.3.

4.3 CART STORAGE. If possible, store the clean cart in a clean; secure area between uses. If storage in a clean area is not possible, store the cart in the EVD waste storage area. If the cart is not stored in a clean area, disinfect the cart prior to use in the MTF.

SECTION 5

EVD WASTE STORAGE AREA

5.1 STORAGE AREA REQUIREMENTS.

5.1.1 Dedicated EVD Waste Storage Area. Keep EVD waste in a separate, secure storage area located away from all other MTFs wastes, including the routine RMW waste storage area.

5.1.2 Location. Identify a location on or near the Logistics loading dock or in the EVD treatment suite. If the EVD waste storage area is in the treatment suite, designate space in the Logistics area to overpack the EVD waste for offsite transport (see Paragraph 5.5 and Section 6). The location must provide security and access control. EVD waste storage is temporary based on inpatient treatment needs. The location must be free from pests (insects and rodents) and protected from inclement weather. Do not store EVD waste with RMW, equipment, secure paper collection bins (for shredding), or supplies.

5.1.3 Security. Secure the EVD waste storage area at all times except when authorized personnel are accessing the area to place waste inside and/or retrieve the EVD waste cart.

5.1.4 Hazard Indicators. Mark the entrance of the EVD waste storage area with the words “Isolation Waste Storage Area—EVD Waste” and the universal biohazard symbol. Marking can be on a formal sign, stenciled paint, and so forth but must be visible upon approach at a minimum distance of 15 feet. Other information may be added at the discretion of the MTF or as required by other applicable regulatory requirements.

5.1.5 Conditions. Maintain the EVD waste storage area in a clean, putrid-free state. If spills occur in the storage area, disinfect them with a 1:10 bleach solution or an EPA-registered, hospital approved disinfectant (see Paragraph 1.7).

5.1.6 Storage Time. The MTF may not be able to control storage time depending on regulatory approval of a special transportation permit. Utilize an area inside a building with air conditioning or a refrigerated storage CONNEX (if outside) if waste is stored longer than one week.

5.1.7 Estimated Storage Size. A CONNEX measuring 20 ft x 8.5 ft x 8 ft is 1,360 cubic feet (cf). Ebola waste generation rates will vary with the severity of the patient illness (more critical equals more waste generation). Emory University generated approximately 40 bags of EVD waste daily for 2 patients. A critically severe patient generates an estimated 20 bags a day (94 cf/day) of waste (35-gallon bags). The Nebraska Medical Center reported 1 EVD patient generated three to four 20-gallon biohazard boxes (36" x 18" x 18") a day (6.75 cf/day).

This document uses Emory University's generation rate as the maximum and the University of Nebraska Medical Center's generation rate as the minimum.

	<i>Minimum patient/day</i>	<i>Maximum patient/day</i>
Generation	80 gallons / 6.75 cf / 0.25 cubic yard (cu yd)	700 gallons / 94 cf / 3.5 cu yd
CONNEX (1,360 cu ft) storage	201 patient/day storage	14 patient/day storage

A 1,360 cf CONNEX could store approximately 14 patient/days of Ebola infectious waste. Add 10–15 percent to the waste/patient/day generation to allow for waste generated incidental to decontamination or transport.

5.2 TEMPORARY OPTIONS. Temporary storage area options include:

1. Renting a refrigerated tractor trailer and parking it on the Logistics loading dock (can rent from Stericycle).
2. Obtaining a MILVAN or shipping CONNEX of appropriate size and locating it on the Logistics loading dock.
3. Designating space inside Logistics in a dedicate area not used for material storage.
4. Converting a room in the EVD treatment suite into a temporary EVD waste storage area.

[Note: MTFs can decontaminate temporary storage trailers/containers once EVD waste storage ends using the guidance provided in APHC (Prov) Technical Information Paper (Decontamination of Equipment Used in the Area of Operations (AO) Impacted by Ebola Virus Disease (EVD)). Though the title states it is for deployment areas, it

provides detailed guidance suitable for equipment decontamination of a MILVAN/CONNEX. See the APHC (Prov) EVD website for this reference at: <http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>.]

5.3 PPE WASTE COLLECTION IN THE EVD WASTE STORAGE AREA. Manage PPE waste generated in the EVD waste storage area as EVD waste. Equip the area with the supplies and equipment necessary to perform the double red-bagging procedure in Paragraph 3.3.3.3. Establish zones in the area to enable personnel to doff PPE into a clean zone as they exit the area. Position an outer 55-gallon EVD waste drum in the area to seal the PPE wastes after they are double red-bagged. Seal the drum and maintain it in the EVD waste storage area.

5.4 OUTER 55-GALLON EVD WASTE DRUMS. MTFs must use special 55-gallon drums to pack the red-bags in for contracted EVD waste transport according to the DOT-SP (see Section 6). EVD waste generation rates require a minimum starter supply of drums on site (1 pallet of 8 drums). Store the drums near the EVD waste storage area to facilitate packing red bags in the drums in the EVD waste storage area unless the staff completes the drum packaging in the treatment area.

5.5 OVERPACK SALVAGE DRUMS. Currently, the sole EVD treatment contractor in the United States (Veolia ES Technical Solutions, L.L.C.) requires use of an optional outer salvage drum listed in the DOT special permit as an overpack to the outer shipping drum (See Section 6). The drum must be a UN1H2 approved drum with a maximum capacity of 95 gallons tested and certified to a minimum PG II performance level. Be advised, the 55-gallon, fiberboard EVD waste drums acquired through Stericycle are taller than the standard 55-gallon drum. Therefore, not all overpack drums are suitable for use. The installation Directorate of Public Works (DPW) may have stocks of overpack salvage drums for hazardous material and waste management. If so, the DPW overpack salvage drums may be available to the MTF for training purposes and acquisition if necessary. The Eagle, model number 1690, 95-gallon overpack poly drum is one drum that will properly contain the fiberboard drums from Stericycle.

Upon positive EVD diagnosis, acquire the overpack salvage drums and store them near the Logistics loading dock to facilitate packing the 55-gallon EVD waste drums and movement into the Stericycle truck. Do not place the overpack salvage drums in the EVD waste storage area.

SECTION 6

CONTRACT REMOVAL UNDER SPECIAL DOT PERMIT AS UNTREATED EVD WASTE

6.1 BACKGROUND. Governing regulations for EVD waste are more stringent than regulations for routine RMW.

The DOT categorizes Ebola and any waste generated during patient care as a Category A Infectious Substance Affecting Humans. All DOT transportation requirements for a Category A Infectious Substance are specified in the Title 49 CFR Parts 171-180 for domestic transport. Current regulations do not authorize U.S. medical waste contractors to transport this waste. The DOT must issue exceptions to these transportation requirements by Special Permit (DOT-SP) to allow for EVD waste transport. On 13 February 2015, the DOT issued a second revision to DOT-SP 16279 based on the application of Veolia ES Technical Solutions, L.L.C. According to DOT-SP 16279, additional companies may apply for “party status” authorizing them to transport EVD waste using the same special permit. Transporters may not transport EVD waste per DOT-SP 16279 without an accompanying individual “party status” authorization letter to the transporting company. The DOT granted Stericycle a party status authorization to DOT-SP 16279 on 16 January 2015 with an expiration date of 31 March 2017.

In 2014, MEDCOM Logistics personnel facilitated a contract modification of the existing MEDCOM-wide Stericycle contract for all CONUS Army MTFs. The modification included stipulation that Stericycle manage EVD waste transport according to SP 16279 (or other applicable DOT special permits) and to allow all applicable DOD medical facilities with EVD waste to utilize Stericycle for disposal.

Some States classified EVD waste as a hazardous waste (HW). If your State requires transport of EVD waste by a registered HW transporter, you can search the DOT special permits page to identify HW companies holding party status authorization for DOT SP-16279. Go to the following page and enter 16279 in the permit number field: <http://phmsa.dot.gov/hazmat/regs/sp-a/special-permits/search>

6.2 DOT-SP 16279 PACKAGING REQUIREMENTS. The DOT-SP requires transportation with conditions that special packaging procedures be used to meet Category A Infectious Substances Affecting Humans transportation regulations. These packaging requirements include use of 55-gallon drums and alternate sized packages for items that will not fit into a drum, such as mattresses, that require special packaging

permission from the PHMSA. The drums approved under DOT-SP 16279 are the outer packaging step of a triple packaging requirement. Section 3 details the primary and secondary packaging steps. Paragraph 6.3 specifies both the outer drum packaging and large item packaging requirements.

Each MEDCOM MTF was authorized to acquire a starter pack (8 drums) of the Category A “Green Drums” for training and initial response to a positive EVD patient. Stericycle will provide additional drums upon request through the MTF Stericycle representative at a cost to the MTF. When a positive EVD patient is identified, contact Stericycle and request overnight delivery of a sufficient number of Category A “Green Drums” and drum labels. If Stericycle is unable to provide the drums, the MTF may attempt to request purchase of the drums through the installation DPW supplier as long as the drums meet the following specifications as extracted from DOT-SP 16279:

1. A rigid United Nations (UN) Standard or DOT-Approved non-bulk packaging with a maximum capacity of 55 gallons. The packaging must be tested and certified at a minimum to the PG-II level for solids or liquids. The packaging certification must equal a maximum gross mass greater than or equal to the mass of the packaged waste.

2. If the outer packaging is fabricated from corrugated fiberboard, it must be a minimum of triple-wall corrugated fiberboard and contain a polyethylene liner with a minimum thickness of 6 mils (0.006 inch). The liner must be sealed and securely closed in accordance with the manufacturer’s instructions to prevent the release of any material from the bag if inverted. Corrugated fiberboard outer packaging may not be reused under the terms of the DOT-SP.

6.3 PACKAGING STEPS FOR STERICYCLE TRANSPORT.

6.3.1 Outer 55-Gallon EVD Waste Drums. Complete the following packaging steps to prepare the red-bagged waste for approved Stericycle pickup:

1. Line the drum with the 6-mil liner if not already lined.
2. Place an absorbent spill pad or absorbent material inside the 6-mil drum liner. Note: the “Green Drums” do not include the required absorbent material/pads.
3. Place the double-bagged red bags into the lined drum.
4. Securely tie the liner, and close the container per the packaging instructions provided with the drum.

5. Treat (spray or wipe) the entire outer surface of the drum with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7) and allow it to air dry. Do not over saturate the corrugated fiberboard drum with disinfectant to prevent damaging the integrity of the drum.

6. Affix the special Category A DOT waste labels provided by Stericycle.

7. Secure the drums in the dedicated EVD waste storage area until the Stericycle truck arrives to pick up the waste.

6.3.2 Overpack Salvage Drums. After a positive EVD patient diagnosis, the MTF must acquire 95-gallon overpack drums to complete the packaging for shipment.

6.3.2.1 Using Mechanical Means to Load Overpacks. Overpack salvage drums weigh 50 to 75 pounds empty and may require a cart or lift to maneuver them onto the Stericycle truck. The MTF is responsible for loading the waste onto the truck. The DOT-SP 16279 states that, "Fork trucks or other mechanical means may not be used for loading and unloading the vehicle unless no other option exists. When fork trucks or other mechanical means are used, extreme care must be taken to prevent puncture and/or rupture of the package. PHMSA must be notified prior to use of the mechanical means to load or unload the vehicle." Contact the Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590 or call the Hazardous Materials Special Permits and Approvals at (202)-366-4535 to provide the notification of intent to use mechanical means.

6.3.2.2 Overpack Steps. Complete the overpack requirement for all waste transported to the Veolia ES Technical Solutions, L.L.C. treatment facility using the following steps:

1. Contact MEDCOM Environmental to coordinate purchase of the overpack drums after positive EVD diagnosis.

2. If fork trucks or other mechanical means are required for loading the packed salvage drums onto the truck, contact the DOT according to Paragraph 6.3.2.1 and provide the intended equipment, use, and location.

3. Utilize a secure area near or on the loading dock to complete the overpacking process.

4. Do not place the overpack salvage drums in an EVD contaminated area.
5. Place each packed and sealed EVD waste drum into an approved overpack salvage drum (see Paragraph 5.4 for drum specifications).
6. Close and seal the overpack salvage drums according to the manufacturer's instructions.
7. Apply tape to secure the lid to the overpack salvage drum and prevent tampering.
8. If the overpack salvage drum enters an EVD contaminated area, treat (spray or wipe) the entire outer surface of the drum with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7). Allow the drum surface to air dry.
9. Affix the required special Category A DOT waste labels and markings to the overpack salvage drum (see Appendix C).
10. Maintain security of the area until all drums are loaded onto the truck for transport.
11. Operate fork trucks or other mechanical means with extreme care to prevent puncture or rupture of the package.

6.3.3 Large Articles. The large article packaging system is required for all Category A Ebola-contaminated wastes that will not fit into the 55-gallon packaging. If you have a large article, contact Stericycle to request special packaging for the item. Category A Ebola contaminated waste will only be packaged according to this packaging scenario if it has been documented that packaging in a 55-gallon drum is not possible. The MTF must notify the PHMSA if this packaging method is required. Contact the Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590 or call the Hazardous Materials Special Permits and Approvals at (202)-366-4535.

1. Disinfect the entire surface of the article with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).
2. Double bag the article in inner bags meeting the requirements for Category A shipment in 55-gallon drums for inner bags (see Paragraph 3.3.1.1) and fill and seal the bags according to the requirements of Paragraph 3.3.3.3. If bags are not

an option, enclose the item in two layers of plastic sheeting that is marked and certified as passing the tests prescribed for the inner red bags (see Paragraph 3.3.1.1) and follow steps 3-7 below.

3. Seal the large article inside the first sheet with the opening (ends) twisted closed. Seal all seams with at least two wraps of duct tape. Seal all other openings with at least two wraps of duct tape or two ZIP-TIES[®] to insure closure of the wrap. Disinfect the outer surface of the wrapped article with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7). (ZIP-TIE[®] is a registered trademark of ZIPTEL, LLC.)

4. Repeat step three with the second sheet of plastic.

5. If practical, package the wrapped article in a 95-gallon, UN1H2-salvage drum certified at a minimum PG II performance level. After filling the drum, seal and securely close the drum. After closing, apply tape to the drum to secure the lid and prevent tampering.

6. If the item is too large to package in a 95-gallon salvage drum, seal the wrapped article in a 6-mil polyethylene sheet and completely enclose the item. Securely seal all seams with tape so material cannot escape.

7. Disinfect the outer surface of the plastic sheet with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).

8. Repeat steps 6 and 7 with a second sheet of plastic.

6.4 DOT SHIPPING DESCRIPTION. The EVD waste hazardous material shipping description is:

UN2814, Infectious substances, affecting humans (Ebola Waste), 6.2

According to Title 49 CFR Part 172.203, the MTF must add the number and types of packages and the total quantity of EVD waste shipped to the shipping description.

The MTF must use this shipping description on all EVD waste shipping papers.

6.5 DOT SHIPPING PAPERS. Stericycle created and used special EVD shipping papers for the 2014 EVD waste shipments in Texas and New York. Stericycle will provide the shipping papers as part of an EVD emergency shipping packet once a positive EVD diagnosis occurs. After obtaining a positive EVD diagnosis, contact

Stericycle immediately and request an overnight delivery of the required EVD shipping packet. The packet will provide the MTF with the required EVD shipping paperwork and required labels and markings (if not already in stock at the MTF).

6.6 TRAINING REQUIREMENTS FOR SIGNING MANIFESTS. Only personnel who 1) are appointed in writing by their Commander to sign manifests for EVD waste; and 2) have successfully completed the DOD-approved USAPHC Transport of Biomedical Materials Course (or 80-hour Defense Hazardous Material Packaging for Transport Course), may sign EVD waste shipping papers. The USAPHC Medical Waste Transport course does not meet the requirements for signing these manifests. See Appendix D for an EVD waste shipper's appointment order template.

6.7 REQUIRED PERMIT DOCUMENTS. The MTF must maintain a current copy of DOT-SP16279 and the "party status" authorization letter granted to the contracted transporter.

6.8 TRANSPORT MARKINGS AND LABELS. Appendix C provides a schematic that depicts the required markings and labels for the EVD waste drum and overpack drum. The regulatory requirements for these markings and labels are:

1. 49 CFR 172.301 (a) – Proper shipping name and UN identification number "infectious substances, affecting humans, UN 2814"
2. 49 CFR 172.301(c) – Special permit packagings. The EVD waste drums must include the DOT special permit that authorizes their use. "DOT-SP 16279"
3. 49 CFR 172.301(d) – Shipper's and receiver's names and addresses "MTF name and address + Stericycle name and address"
4. 49 CFR 172.312(a)(1) and (2) – Packed with closures upwards and package orientation markings for liquids "Arrows up marking"
5. 49 CFR 172.101, Column 6 – A division 6.2 hazard warning label depicted in 49 CFR 172.432 is required "DOT Class 6 Infectious Substance Label"
6. 49 CFR 173.25(a)(4) – The overpack salvage drum is marked with the word OVERPACK.

7. 49 CFR 172.406(a)(1)(i) – Placement of labels. Labels must be printed or affixed to a surface of the drum that is on the same side/surface and as the proper shipping name and near the proper shipping name.
8. 49 CFR 178.3 and DOT-SP 16279 paragraph 7.b.(1)(A) and (D). The manufacturer must mark the EVD waste drums and overpack salvage drums with the required DOT/UN specification markings to indicate the drum certification is a packing group II or greater level for solids and liquids. “Drum has UN number containing the code X or Y”

SECTION 7

ONSITE TREATMENT FOR ROUTINE CONTRACT REMOVAL AS TREATED RMW

7.1 BACKGROUND. Stericycle is the RMW transporter and treatment contractor for all Army MTFs. If MTFs autoclave EVD onsite, the waste classification is downgraded from a Category A Infectious Substance to normal RMW. The downgraded classification to RMW will allow Stericycle to remove the waste and transport it for final disposal according to routine practices. Note: autoclave treatment kills EVD. The waste from EVD patient care requires additional RMW treatment after autoclaving because it was red-bagged and contains sharps. If a non-red bagged item is autoclaved (such as a personal property item), it will not require RMW treatment.

7.2 AUTOCLAVE TREATMENT FOR ROUTINE RMW TRANSPORT. This is a course of action available to an MTF if the preferred contract removal with DOT-SP option is not possible. Autoclave treatment is also an approved treatment technique at locations with currently installed RMW autoclaves and shredders.

7.3 AUTOCLAVE CONSIDERATIONS.

7.3.1 Site Considerations. Medical waste autoclaves require water, electricity, and space. Consider the following before siting an autoclave (permanent or mobile). Do not use portable autoclaves with external reservoirs because reservoir contamination during gravity charging is theoretically possible.

- Additional equipment purchases such as carts, ramps, PPE
- Training needs for operators
- Who will operate the autoclave (check housekeeping contracts)
- Electricity
- Water requirements and water drainage
- Water treatment if necessary
- State or local water discharge requirements
- Steam supply
- Transportation route of infectious waste to autoclave
- Security and access control
- Back-up generator
- Treatment capacity

7.3.2 Estimating Treatment Capacity. Medical waste autoclaves vary in capacity from 7.5 to 20 cf. Emory University generated approximately 40 bags of EVD waste daily for two patients. A critically severe patient generates an estimated 20 bags a day (94 cf/day) of waste (35-gallon bags). The Nebraska Medical Center reported one EVD patient generated three to four 20-gallon biohazard boxes (36" x 18" x 18") a day (6.75 cf/day). Emory University generated approximately 40 bags of Ebola waste daily for two patients. This document uses Emory University's generation rate as the maximum and the University of Nebraska Medical Center's generation rate as the minimum.

	<i>Minimum patient/day</i>	<i>Maximum patient/day</i>
Generation	80 gallons / 6.75 cf / 0.25 cu yd	700 gallons / 94 cf / 3.5 cu yd
7.5 cu yd autoclave	28 patient/day per load	2 patient/day per load
20 cu yd autoclave	80 patient/day per load	4-5 patient/day per load

7.4 AUTOCLAVE WASTE MANAGEMENT.

7.4.1. Autoclavable Waste. Autoclavable waste includes all EVD waste appropriately bagged for medical waste treatment. Check with the autoclave manufacturer to determine if autoclave bags must be open for complete disinfection, and adjust this procedure as necessary. Monitor the full red bag sizes to ensure the bags can fit into the autoclave.

7.4.2 Equipment.

7.4.2.1 PPE. Selection and use of PPE while handling EVD waste for autoclaving will comply with hospital IC standards for EVD treatment as specified by the IC Team.

7.4.2.2 Red Bags. All red bags used to collect EVD waste must be leak-proof and puncture-resistant and meet ASTM D 1709-01 and ASTM D 1922-00a standards. Note: the DOT requires the red bag test requirements for contracted offsite RMW treatment. Use autoclave specific bags (orange, clear, etc.) inside the MTF that comply with the onsite autoclave requirements for the double-bagging procedure. The MTF can red bag the waste in required DOT bags after autoclaving if necessary.

7.4.2.3 Autoclave Test Strips. Used to indicate the autoclave process effectively treated the waste and for daily quality assurance of autoclave function.

7.4.2.4 Autoclave Bags. Required for use in some autoclaves as the outer packaging.

7.4.2.5 Autoclave Tape. Required to seal red bags and autoclave bags prior to treatment.

7.4.2.6 Isolation Waste Labels. Self-adhesive labels indicate the EVD hazard with the words "Isolation Waste".

7.4.2.7 EVD Collection Cart. Utilize an enclosed, leakproof cart defined in Section 4, to move EVD waste from the EVD waste storage area to the autoclave. See Section 4 for cart procedures.

7.4.3 Collection of Solid EVD Waste. Follow collection and segregation procedures specified in Sections 3, 4, and 5 for onsite autoclaved EVD waste. The MTF may adjust the sequence and steps if necessary to meet autoclave specific standards (such as bag type, number of bags, etc.). The IC Team must approve and document any variations in requirements specified by Sections 3, 4 and 5. Double bag all sharps containers according to the procedure in Section 3; therefore, only red bags will be referred to in this section.

7.4.4 Autoclave Waste Management Steps. Conduct autoclave specific procedures once the EVD waste is placed in the designated EVD waste storage area. Autoclave all EVD waste using the following steps:

1. Proceed to the EVD waste storage area and don PPE according to MTF procedures.
2. Bring the EVD waste collection cart to the EVD storage area.
3. Seal the red bags with autoclave tape. If required, place red bags in autoclave bags and then tape loosely with autoclave tape.
4. Complete the Isolation Waste label by writing the treatment date on it and affix to the outside of each bag.
5. Carefully place the taped bags into the EVD waste cart. Only pick up bags by the neck and never throw or compress the bags. Do not pick up a bag unless it has been double-bagged at the generation site and marked to indicate that it is EVD waste.

6. Close the lid on the cart prior to moving from the EVD waste storage area to the autoclave site.
7. Wipe/spray the outside of the cart with an EPA-registered, hospital approved disinfectant or 1:10 bleach solution (see Paragraph 1.7) prior to moving the cart from the EVD waste storage area to the autoclave treatment area. If wipes are used, dispose of the wipes as EVD waste (see Paragraph 3.3.3.3).
8. Secure the EVD waste storage area.
9. Notify the Chief, Environmental Services, or Environmental Services supervisor on duty, **(list phone # here)** of the impending transport of EVD waste to the autoclave site.
10. Transport the EVD waste directly from the EVD storage area to the autoclave treatment area using a predetermined, approved route.
11. At the autoclave, carefully place the bags into the autoclave. Do not overload autoclave. Only pick up the bags by the neck, and never throw or compress the bags.
12. Once unloaded, move the cart to the designated cart disinfection area and disinfect according to Paragraph 4.1.3. Do not use the EVD waste cart for autoclave-treated waste even after cart disinfection. Use a separate cart.
13. At the end of the autoclave process, ensure achievement of autoclave pressure, temperature, and time and that indicators and autoclave tape color change confirm disinfection. Place treated waste bags into a clean cart, and move them to the RMW storage area for regular RMW waste transport. If autoclave is the normal MTF treatment method, move the bags to the established waste disposal container for routine disposal after treatment. If controls indicate improper treatment, autoclave the waste again until indicators confirm disinfection.
14. Once unloaded at the RMW storage area, move the cart to the designated disinfection area and disinfect according to Paragraph 4.1.3.
15. If the bags still have visible EVD Waste markings on them after autoclaving and they are going out for contract RMW treatment, add a new marking/label that states "Autoclaved waste for RMW treatment".

SECTION 8

TRANSPORTATION ON INSTALLATION FROM CLINICS TO HOSPITAL

8.1 BACKGROUND. Sick patients may seek initial diagnosis and care in their assigned medical clinics instead of reporting directly to a hospital. Clinics with isolation areas will hold the patients in the isolation room while performing the EVD evaluation and/or testing (or waiting for outside lab support) (see Paragraph 3.3.4). After a positive EVD diagnosis, manage all patient waste in the room as EVD waste according to Paragraph 3.3.3.3 (complete double bagging procedure). Transport the EVD waste from the clinic to the hospital EVD waste storage area. If the patient moves to the hospital for inpatient EVD care and diagnosis, manage the EVD waste according to Paragraphs 3.3.3.3, 3.3.4 and 3.3.5.

8.2 TRANSPORT OF EVD WASTE WITH PATIENT. Transport the EVD patient in a dedicated vehicle according to patient transport protocols. If there is space available in the vehicle, transport the EVD waste from the patient care area to the hospital with the patient.

1. The PPE required to treat an EVD patient is sufficient to move bags of EVD waste managed according to the procedures in Paragraph 3.3.3.3. Personnel will don appropriate PPE. The patient must don a protective surgical mask and impervious outer protective wear over personal clothing prior to movement from the EVD isolation area.

2. Personnel transporting the patient must notify the Chief, Environmental Services, or Environmental Services supervisor on duty, **(list phone # here)** of the impending EVD waste transport to the EVD waste storage area and arrange for access to the storage area.

3. Move the EVD waste to the patient-transport vehicle using the same route through the clinic used to move the patient.

4. Place the EVD waste in the patient care area of the transport vehicle, out of the way of patient care personnel. Secure the waste in a manner that the waste will not roll or slide around during transport. A trash can or other type of nonporous container may be used if it will fit in the vehicle.

5. After removing the patient from the vehicle into the MTF, maintain PPE and transport the waste directly to the EVD waste storage area. Once someone from Logistics arrives to unlock the EVD waste storage area, place the EVD waste into the EVD waste storage area.

6. Proceed to the area designated to decontaminate the vehicle and personnel. Once in that designated area, decontaminate the vehicle and remove PPE according to established procedures for PPE removal and vehicle decontamination (see Section 12).

8.3 TRANSPORT OF EVD WASTE IN DEDICATED WASTE TRANSPORT

VEHICLE. If transport of the EVD waste is required after patient transport, secure the EVD waste in the isolation room and coordinate waste pickup in a dedicated transport vehicle.

1. Do not transport EVD waste in a vehicle that is transporting supplies for patient care or any other type of waste. Dedicate the vehicle strictly for the transport of EVD waste from the clinic direct to the EVD waste storage area at the hospital.

2. Select a government vehicle that can be readily decontaminated (preferably a truck or van with no porous materials such as carpeting). If porous materials are present, cover them with industrial plastic sheeting and secure the plastic with tape to prevent contact of the waste with any porous materials.

3. Personnel transporting the patient must notify the Chief, Environmental Services, or Environmental Services supervisor on duty, **(list phone # here)** of the impending EVD waste transport to the EVD waste storage area and arrange for access to the storage area.

4. Train personnel and provide them with appropriate PPE. Wear appropriate PPE at all times when handling EVD waste and during vehicle decontamination.

5. Move the EVD waste to the transport vehicle using the same route through the clinic used to move the patient.

6. Place the EVD waste in the vehicle and secure it in a manner that the waste will not roll or slide around during transport—a trash can or other type of nonporous container may be used if it will fit in the vehicle. If preferred, use the outer packaging barrels (see Section 6) if all packaging instructions in Paragraph 3.3.3.3 and Section 6 have been followed.

7. Transport the EVD waste directly from the clinic to the EVD waste storage area at the hospital. Once someone from Logistics arrives to unlock the EVD waste storage area, place the EVD waste into the EVD waste storage area. Keep all PPE on.

8. Proceed to the area designated to decontaminate the vehicle and personnel. Once in that designated area, decontaminate the vehicle and remove PPE according to established procedures for PPE removal and vehicle decontamination (see Section 12).

SECTION 9

MORTUARY AFFAIRS AND AUTOPSY WASTES

9.1 EVD WASTE GENERATION FROM HANDLING HUMAN REMAINS. The Ebola virus can spread postmortem through direct handling of human remains. Keep movement and handling of persons who died of EVD to a minimum. Strict adherence to infection-control procedures is a necessity.

9.1.1 PPE. Full PPE is required when handling EVD-contaminated human remains. Splashes from blood or other body fluids (including bodily excretions, secretions, feces, vomitus, saliva, mucus, urine) can spread EVD from the deceased to those handling the deceased if they are unprotected. Dispose of all PPE used in handling EVD-contaminated human remains as EVD waste.

9.1.2 EQUIPMENT AND SUPPLIES. Instruments used on the deceased or materials that came in contact with the deceased (e.g. sheets, mattresses, bed pans, gowns, personal hygiene items) can also spread the disease to healthcare workers and housekeeping staff who come in contact with them. These materials must also be disposed of as EVD waste.

9.1.3 EVD WASTE MANAGEMENT. Manage all EVD solid waste (including PPE and disposable instruments) and accumulated liquid waste according to Sections 3, 4, and 5 and the guidance documents in Paragraph 9.2.

9.2 GUIDANCE.

9.2.1 CDC. Personnel handling persons who died of EVD must follow all safety and health guidelines and adhere to standards published by the CDC:

- CDC Guidance for Safe Handling of Human Remains of Ebola Patients in U.S. Hospitals and Mortuaries (2014, <http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html>) and
- Interim Guidance for Environmental IC in Hospitals for Ebola Virus (<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>)

9.2.2 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

Workers must also adhere to safety standards published by OSHA in their 29 CFR 1910.1030 in addition to the CDC guidelines above.

9.2.3 DEPARTMENT OF DEFENSE (DOD).

DOD personnel must additionally follow USAPHC Technical Guide (TG) 195 (Safety and Health Guidance for Mortuary Affairs Operations: Infectious Materials and CBRN Handling, 4th Edition). The APHC (Prov) published a Technical Information Paper (Handling EVD Human Remains in an MTF) that addresses management of EVD patients who become deceased in the MTF. See the APHC (Prov) EVD website for this reference at:

<http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>.

SECTION 10

MANAGEMENT OF SPILLS AND UNCONTROLLED PATIENT RELEASES

10.1 GENERAL. Spills may occur when handling EVD waste in the MTF. The potential also exists for uncontrolled releases of human excrement (vomit and feces) by patients as they move from initial diagnosis points to isolation areas for care. In both cases, promptly clean and disinfect the contaminated areas as detailed below to protect all in the MTF from exposure.

10.2 NOTIFICATION. If either a spill or uncontrolled release of excrement from a patient occurs, immediately create a cordon around the waste, then contact IC and the Environmental Services Chief to coordinate cleanup and waste management by designated, trained personnel.

10.3 APPROVED PROCEDURES. The IC Team will approve policies and procedures for spill response and cleanup of involuntary patient releases of human excrement.

10.4 DESIGNATED SPILL RESPONDERS. Only designated and trained personnel will respond to spills and releases and conduct the cleanup activities. Ideally, designate and train personnel in clinical areas to effectively respond in their areas. If not, Logistics and IC will appoint/direct appropriate personnel to the scene for cleanup.

10.5 PPE. The IC Team will approve selection, use, and donning/doffing locations for PPE according to hospital IC standards. All personnel involved in cleanup and site supervision will use PPE specified by IC.

10.6 DISINFECTANTS. The IC Team will approve all disinfectants and areas/functions for their use. Use an EPA-registered, hospital-approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7). If directed by IC, additional disinfection may be required depending on the spill/release location and type of contaminated materials (porous or nonporous).

10.7 ISOLATE THE AREA. Immediately remove unprotected staff and patients from the spill/release area, and take measures to block access to the site. Ensure that only designated personnel in appropriate PPE approach the spill/release. Isolate area after disinfection until no wet surfaces remain.

10.8 CLEANING SUPPLIES AND EQUIPMENT. Use disposable cleaning supplies and equipment (such as absorbent pads, mops, wipes, scoops, and so forth) to clean spills and releases. Spill responders must bring required EVD waste red bags to the area before beginning the cleanup process. Do not use wet vacuums to avoid the potential for aerosolization of the waste and creation of excess liquid wastes that must be treated and released down the drain. Unless the EVD waste will be autoclaved, using liquid solidifiers such as Isolyser[®] may be the preferred approach to allow solidification of the excrement. Gently scoop up solidified materials. After the solids are removed, disinfect the area according to Paragraph 10.6. Because some solidifiers are incompatible with autoclaving, do not autoclave EVD waste containing solidifiers. Use general absorbent spill cleanup materials instead. (Isolyser[®] is a registered trademark of WCM, Inc.).

10.9 WASTE DISPOSAL. Dispose of cleanup materials (such as absorbent pads, mop heads, wipes, and so forth) and PPE as EVD waste. The EVD waste must be double-bagged in red bags according to the procedure in Paragraph 3.3.3.3, and then transported to the EVD waste storage area according to Section 4. Infection Control will specify where and how to remove PPE for EVD waste disposal. Mop handles and frames may be disinfected for reuse if: (1) personnel covered the mop handles and frames with a plastic bag or impermeable material prior to use in the EVD treatment area; (2) personnel used an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7) to clean the equipment; and (3) IC personnel approve them for reuse.

10.10 DECONTAMINATION GUIDANCE. The APHC (Prov) published a Technical Information Paper, (Decontamination of Equipment Used in the Area of Operations (AO) Impacted by Ebola Virus Disease (EVD)) that addresses decontamination of equipment used in areas impacted by EVD. Reference this document for decontamination of various porous and nonporous items in the MTF. See the APHC (Prov) EVD website for this reference at:

<http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>.

SECTION 11

TRAINING

11.1 GENERAL. Training is a crucial step toward properly segregating and managing EVD waste to prevent occupational exposures. Supervisors must inform personnel of their designated responsibilities and the procedures required to execute those responsibilities. The MTF must provide personnel with opportunities to practice in non-infectious situational training prior to actual EVD situations to establish techniques necessary to protect themselves and others.

11.2 IDENTIFICATION. The IC Team will identify training requirements for all personnel with designated rolls pertaining to EVD waste management including—

- Isolation room/anteroom personnel tasked with EVD waste management.
- Spill/release responders and cleanup personnel.
- Personnel who move EVD waste through the MTF (pickup and transport from wards/rooms to storage area).
- EVD Cart Disinfection.
- EVD Waste Storage Area Managers.
- Autoclave Treatment.
- Transport of EVD Waste from clinics to the MTF EVD Storage Area.
- Mortuary Affairs.
- Laboratory Specimen Handlers.
- Clinic personnel who will manage EVD Waste from initial diagnoses.
- Personnel tasked with emergency vehicle/waste transport vehicle decontamination.
- Personnel responsible for decontamination of reusable medical equipment.
- PPE assistants and site monitors.

11.3 PPE. Establish and communicate PPE requirements and procedures to all designated personnel with EVD waste management roles and responsibilities. Once the procedures are established, provide personnel with functional training on: donning PPE, doffing PPE, and waste collection in each applicable area (such as wards, clinics, EVD waste storage, cart disinfection, and so forth).

11.4 FUNCTIONAL TRAINING. Develop functional hands-on training exercises to enable all personnel with EVD roles and responsibilities (Paragraph 11.2) to practice their procedures while wearing appropriate PPE to rehearse for the real EVD situations.

Appoint monitors to observe the training exercises and identify weaknesses that require additional training. The IC Team will develop training with input from relevant supervisors and personnel with subject matter expertise.

11.5 EXPOSURE CONTROL PLAN. Evaluate personnel with the potential to have occupational exposure to EVD waste under the MTF's exposure control plan and provide them with a Bloodborne Pathogens Standard (Title 29 CFR Part 1910.1030) refresher course.

11.6. DOCUMENTATION. Supervisors will maintain written documentation of all training for 3 years. Training records will include a summation of the designated EVD waste management responsibilities, training content summary, dates, length of training, trainer, and training location (onsite, classroom, and so forth).

11.7 INFECTIOUS SUBSTANCE SHIPPERS. Only personnel with training specified in Paragraph 6.6 will sign shipping manifests for EVD waste.

SECTION 12

VEHICLE AND TRANSPORT EQUIPMENT DECONTAMINATION AREA

12.1 DESIGNATED AREA. Vehicles used to transport EVD patients and EVD waste from clinics to the MTF will require interior decontamination in a designated area. Decontamination includes removal of any excrement and body fluids released from the patient during transport, spraying/wiping the plastic liner with approved disinfectant, removing the plastic liner, and cleaning all exposed contact surfaces of the vehicle. Designate a secure area to prevent access from unauthorized personnel during the decontamination process (such as the Logistics loading dock). If the vehicle exterior requires decontamination, select a secure area with the ability to capture liquid disinfection solutions such as a mass-casualty decontamination facility with a waste water collection tank.

12.2 PPE. The IC Team will approve selection, use, and donning/doffing locations for PPE according to hospital IC standards. All personnel involved in vehicle decontamination and site supervision will use PPE specified by IC.

12.3 WASTE. Manage liquid and solid wastes generated during vehicle and equipment decontamination as EVD waste according to Sections 3, 4, and 5.

12.4 DECONTAMINATION PROCEDURES. Decontaminate vehicles and equipment according to the guidance provided in the APHC (Prov) Technical Information Paper (Decontamination of Vehicles Used for Transportation of Potential Ebola Virus Disease (EVD) Patients or Related Equipment) that addresses decontamination of equipment to transport EVD patients. See the APHC (Prov) EVD website for this reference at: <http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>.

12.5 WASTE WATER MANAGEMENT AND TANK CLEANING.

12.5.1 Mass Casualty Facility Design. Most MTF mass-casualty decontamination facilities are designed with a drain to an underground waste water holding tank(s). The tank design includes a pump that can pump the fluid to the sanitary sewer system if deemed acceptable (or once appropriately disinfected and deemed acceptable for discharge to the sanitary sewer). The Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) team most likely determines the facility functions, so plans to utilize the facility must be coordinated through appropriate CBRNE personnel.

12.5.2 Disinfection of Collected Waste Water in the Tank(s). Once decontamination activities have ended (or the tank fills up), treat the waste water collected from vehicle decontamination prior to discharge into the sanitary sewer system.

12.5.2.1 Tank Treatment. A ratio of 500 parts per million (or ppm) disinfectant/water solution to one part virus for 15-minutes contact time will kill Ebola (see World Health Organization (2014)).

12.5.2.2 Disinfection Ratio. To achieve the desired concentration, add approximately 1 part household bleach (5% or greater sodium hypochlorite) to 99 parts of water. For Example: to treat a 1000-gallon tank, mix 10 gallons household bleach and 990 gallons of wastewater. This is the suggested level of disinfection for body fluids and grossly contaminated items/surfaces; therefore, it will be an overly conservative ratio, considering the decontamination water would presumably be mostly water (chlorinated for potable), have some disinfectant already in it, and a bit of contamination or body fluids. Avoid splashing while adding bleach to the tank.

12.5.2.3 Dechlorination. After the minimum contact time of 30 minutes, add dechlorination pellets to reduce the effects of the bleach prior to discharge into the WWTP. Check the effects with pH paper. As the pellets start to work, the pH will move closer to the neutral value of 7. This will prevent corrosion of sewer pipes and the tank. If possible, allow the solution to sit for an extended period of time (12 hours) to dissipate the chlorine and further reduce the potential for corrosion and interference at the WWTP.

12.5.2.4 Discharge Notification. Prior to discharge, contact the DPW and WWTP operator to provide notification of the intended discharge of treated waste water. [Note, DPW may prefer to contact the WWTP.] Provide the pH value and a description of efforts taken to neutralize the chlorine (dechlorination pellets and contact time) to DPW and the WWTP.]

12.5.2.5 Advanced Chlorine Addition. If advanced notice is given that decontamination will take place, add 1 to 2 gallons of bleach to the tank prior to filling the tank with decontamination waste water. This will facilitate better mixing and disinfection of the water as it enters the tank. Only pre-place the bleach in the tank if personnel will use the tank within 4 hours of placing the bleach in the tank. Otherwise, the bleach can damage the tank.

SECTION 13

EVD WASTE STORAGE AREA TERMINAL CLEANING AND FINAL PPE WASTE MANAGEMENT

13.1 GENERAL. The threat of EVD infection warrants stringent terminal cleaning of the EVD waste storage area after the MTF discharges an EVD patient. The EVD waste storage area will be the last area cleaned because it must hold the waste until the final contracted pickup for offsite transport. Decontamination and terminal cleaning procedures will vary from all other areas because there will be no EVD waste accumulation in this area once the last waste pickup is conducted. The same situation exists for the last people wearing PPE after sealing up the final drum of EVD waste. Implement the procedures in this Section after implementing all other possible terminal waste collection, disinfection and cleaning procedures in the patient care areas and removing all EVD waste from the EVD waste storage area for treatment and disposal according to Sections 3 and 6. The only wastes remaining will be those generated during the EVD waste storage area terminal cleaning process and final drum handling as the sealed EVD drums are loaded into the transport vehicle, which will be managed according to this Section.

13.2 APPROVED PROCEDURES. Infection Control personnel will assess and evaluate the decontamination procedures to ensure safety and effectiveness. Infection Control personnel will observe the decontamination process and provide oversight to ensure all items and areas are properly decontaminated and cleaned. Observation and oversight will include use of checklists, individual performance assessments, and required on-the-job corrections.

13.3 PPE. All personnel involved in cleanup and site supervision will use PPE specified and approved by IC. Selection of PPE for the EVD waste storage area terminal cleaning procedures and final waste handlers will incorporate capabilities of the PPE to be disinfected by wet disinfectant spray/drenching techniques without degradation and breakthrough during the required disinfectant contact time. The PPE will provide the required full skin and respiratory protection from the disinfectant used.

13.4 DISINFECTANTS. The IC Team will approve all disinfectants used to terminally clean the EVD waste storage area and to disinfect PPE worn during final waste handling procedures. Use an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7). Note the required disinfectant contact time and ensure the contact surface remains wet with disinfectant for the required time. Apply disinfectant sprays or foams to provide 100% coverage of the PPE surface areas. Apply the disinfectant in sufficient quantity and allow sufficient time to eliminate the EVD

hazard.

13.5 TERMINAL CLEANING CONSIDERATIONS. Terminal EVD cleaning and disinfection objectives are to: (1) dispose of any contaminated supplies and equipment; (2) dehydrate the room and remaining equipment; (3) manually clean and disinfect all applicable surfaces (directed by IC); and (4) disinfect all equipment and surfaces in the area with ultraviolet light or gas encapsulation technology. Consider the following when developing local EVD terminal cleaning procedures:

13.5.1 MEDCOM Guidance. The MEDCOM Standard Operating Procedure, Ebola Virus Disease Environmental Cleaning and Disinfection in the Medical Treatment Facility, 31 October 2014, provides cleaning and disinfection techniques to be used during the terminal cleaning steps defined in Paragraph 13.6.

13.5.2 Terminal Cleaning the EVD Patient Treatment Area. Conduct terminal cleaning procedures in the patient care area(s) prior to beginning the EVD waste storage area terminal cleaning procedures. Package all wastes generated during terminal cleaning of patient care areas as EVD waste according to Paragraphs 3.3 and 6.3. Reference APHC (Prov) TIP No. 3-033-0616, Terminal Cleaning for Ebola Virus Disease (EVD) Contaminated Patient Care Areas. See the APHC (Prov) EVD website for this reference at:
<http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>.

13.5.3 Time. Isolation rooms converted into EVD waste storage areas may be required to treat other patients once the EVD patient treatment ends. Develop a local protocol to permit deviation from the recommendations in Paragraph 13.6.1 below (criteria for deviation, who has authority to issue, reviewers, revised cleaning goals, etc.) when rapid turnaround of the treatment area is required.

13.5.4 Compatibility. Consult with Medical Maintenance, Industrial Hygiene, Safety, Facilities, Engineering, and other applicable personnel to evaluate potential damage to all medical equipment and storage area surfaces when subjected to disinfection chemicals and ultraviolet germicidal irradiation (UVGI).

13.5.5 Area Layout. If personnel intend to use gas/vapor disinfection, air must reach all applicable surfaces for effective gas disinfection in the storage area including interiors of empty waste containers/tubs/totes, chairs, cabinets, etc. If personnel intend to use UVGI disinfection, they must inspect to prevent equipment, furniture, and/or other items from blocking the UV light and reducing the effectiveness of UV disinfection. To increase UV disinfection effectiveness, perform UV disinfection multiple times from different locations until the UV light contacts all surfaces in the room.

13.5.6 Thorough Daily Cleaning. Prior to final removal of the last EVD waste drum, designate personnel to conduct a thorough cleaning to remove all visible traces of waste, blood, feces, dirt, etc. on the surface areas because disinfection chemicals and UVGI are ineffective against EVD virus imbedded in organic matter. Dispose of the cleaning supplies and PPE in the last EVD waste drum(s) and package according to Paragraphs 3.3 and 6.3.

13.5.7 Removing Protective Coverings. Remove any sheeting and coverings prior to closing the last EVD waste container. This will allow EVD waste disposal of these items. Remove the items in a step-by-step process to avoid unnecessary cross contamination (i.e. ceiling first, next walls, then equipment, etc.). Dispose of the protective coverings in the last EVD waste drum(s) and package according to Paragraphs 3.3 and 6.3.

13.6 TERMINAL CLEANING AND DECONTAMINATION. These steps begin after removing all EVD waste from the EVD waste storage area. Begin terminal cleaning by staging required RMW collection containers of suitable size and construction (leak proof, rigid, etc.) in the cold zone just outside the storage area after the initial dehydration step is complete.

13.6.1 Initial Dehydration. If possible, adjust the ventilation system to achieve high air flows of 15-19 HEPA filtered air exchanges per hour to desiccate any remaining viruses. If this is not possible, activate floor fans. Open cabinets and doors and otherwise provide airflow access to applicable surfaces. Seal the area in an undisturbed condition for 48 hours. After the 48-hour period, adjust ventilation to normal air flows and commence with manual cleaning procedures below. If rapid turnaround of the treatment area is required, enact the local protocol prescribed in Paragraph 13.5.3 and document the decision.

13.6.2. Surface Cleaning. Clean all surfaces (walls, empty waste containers/tubs/totes, chairs, cabinets, etc.) with bleach or approved disinfectant. Open trash cans, totes, tubs, etc. and clean the inside and outside surfaces. Treat all surfaces associated with EVD waste storage regardless of the amount of visible contamination observed or the time passed since the waste left the area. Conduct the surface cleaning procedure twice. Collect all cloths, wipes and cleaning supplies as RMW according to Paragraph 13.7.

13.6.3 Floor Cleaning. Mop the floors twice with an EPA-approved hospital disinfectant or a 1:10 bleach solution (see Paragraph 1.7), starting with the furthest area from the door and ending at the door. When it is time to dispose of the mop water, add 1 cup of the same approved hospital disinfectant or bleach solution used during the floor

cleaning process to the dirty mop water and allow 15 minutes of contact time. (Note: be careful not to mix incompatible disinfection chemicals during the cleaning process). Pour treated mop water down the closest drain to the sanitary sewer (not storm water) and pour an equivalent container size of water down the drain after the mop water. After floor cleaning is completed, dispose of the mop heads, mop buckets, micro fiber clothes, dusters, toilet brushes and other cleaning devices, handles, and frames as RMW waste according to Paragraph 13.7. Mop handles and frames may be disinfected for reuse if: (1) personnel covered the mop handles and frames with plastic material prior to use, (2) personnel cleaned them with an EPA approved hospital disinfectant or a 1:10 bleach solution (see Paragraph 1.7), and (3) IC personnel approved them for reuse.

13.6.4 Waste Disposal. Dispose of decontaminated terminal cleaning wastes and PPE as RMW (see Paragraph 13.7.3). Designated waste handlers will remain on hand outside the area to move the containerized waste to the RMW waste storage facility or the autoclave. Follow established MTF RMW waste management procedures for the treated, packaged wastes.

13.6.5 Ultraviolet germicidal irradiation (UVGI). In January 2015, MEDCOM Logistics approved UVGI as the preferred technology for the final EVD disinfection step. Acquire a UVGI treatment device for use in the final stage of terminal cleaning and follow the manufacturer's instructions for use and safety warnings. Mercury or xenon gas lamps generate ultraviolet C (UV-C) light. The UV-C light deactivates bacteria, viruses, and spores. The UV-C light may not extend into all the cracks and crevices in the EVD waste storage area; however, it will reach all the surfaces touched by waste handlers. This treatment option is relatively quick, repetitious, and leaves no residue. If gas/vapor disinfection is preferred, see Paragraph 13.5.6.

1. Ensure UV equipment operators use enough devices or conduct sufficient treatment cycles in the storage area to treat all exposed surfaces. Treat areas with a higher likelihood of contamination (e.g., entrance to the storage area) for a longer time period to increase disinfectant exposure.

2. Place treatment monitors at the darkest, furthest locations to ensure the treatment reaches all surfaces.

3. Assess the treatment area size to determine the appropriate amount of time to allow the by-products of the treatment process (ozone) to clear the area prior to re-entry. If applicable, activate the negative pressure system for the assessed time to remove any treatment bi-product.

13.6.6 Gas/Vapor Disinfection. MTFs that acquired gas/vapor disinfection technologies may use them instead of UVGI. Conduct encapsulated gas/vapor treatment of the waste storage area using the selected disinfectant and treatment method (e.g., hydrogen peroxide vapor, chlorine dioxide, etc.). The amount of time required to effectively decontaminate the area will depend on the concentration used, the contact time, environmental controls (maintaining the temperature and/or concentrations), the size of the space (this will be a factor for reaching the desired concentration), and the integrity of the encapsulation (maintained positive pressure, sealed, etc.). Personnel must validate the treatment process to demonstrate adequate disinfection of all locations within the enclosed area.

1. Seal the area from the outside using duct tape and plastic sheeting around doorways and potential leakage points to prevent gas/vapors from escaping the treatment area. Disinfection gases must not escape the area and impact patient or staff health.

2. Ensure that personnel utilize all required safe guards (ventilation, separation, monitors).

13.6.7 Terminal Cleaning Record. Mark hand receipts of equipment dedicated to the EVD waste storage room with the terminal cleaning date, time and method. Affix a label or a tag to all portable equipment (RMW totes/tubs, trash cans, hand carts, etc.) in the storage area and annotate the date and time of surface cleaning (Paragraph 13.7.2) and UVGI/gas disinfection (Paragraph 13.7.5).

13.6.8 Repair Quarantine. Hold disinfected equipment that requires repair in a two-week quarantine status from the date of the UVGI treatment before initiating repairs.

13.6.9 Clean to Remove Disinfectant Residue. After completing all EVD terminal cleaning steps (Paragraphs 13.6.1 – 13.6.6), don standard hospital cleaning PPE to enter the area. Thoroughly clean the area and all equipment to remove chemical residuals left during the area disinfection process. Medical Maintenance and other functional groups may retrieve decontaminated equipment from the area if necessary.

13.6.10 Final Equipment Cleaning. While wearing appropriate PPE, Medical Maintenance and other functional groups will clean and disinfect all equipment removed from the quarantine according to manufacturer's guidance and MTF policies. Select and manage cleaning supplies and PPE generated during this step according to routine housekeeping procedures.

13.6.11 Staff Monitoring. Enforce proper monitoring of staff involved in terminal cleaning, handling, or management of contaminated waste, equipment, and materials. Maintain a list of the names and contact information for all crews or individual workers involved in terminal cleaning duties for use by all members of the EVD Occupational Health or Safety team.

13.7 DECONTAMINATING WASTES AND PPE. Personnel must perform wet decontamination of terminal cleaning wastes and PPE prior to RMW disposal. Terminal cleaning personnel will use approved disinfectants and observe required disinfectant contact times (Paragraph 13.4).

13.7.1 Equipment and Supplies. Acquire the following:

- PPE
- Disinfectant
- Spray applicators
- Two waste water collection pools with >4 inch berms to contain the disinfectant – can be small enough for one person to stand comfortably in the pool.
- Pump and hose connected to a portable 55-gallon collection drum
- Chair, stool, or walker to assist with PPE doffing
- Rack or device to hang disinfected PAPR equipment
- RMW collection container (totes/tubs) – leak-proof with lid
- RMW red bags approved for use in MTF and contracted transport
- Tape or ties to close red bags
- Gloves
- Tape/labels/tie tags to mark RMW containers
- Marker
- Watch, timer, or clock
- Food coloring or compatible dye product – add to disinfectant
- Hand sanitizer

13.7.2 Terminal Cleaning PPE Decontamination. The procedures outlined in this section are required to decontaminate the PPE and safely step the terminal cleaners out of their PPE.

13.7.2.1 Decontamination Assistants. Appoint and train (see Section 11) a minimum of two decontamination assistants. These two personnel will assist each terminal cleaner during the PPE decontamination and doffing procedure. Assistants will spray the disinfectant and assist with removal of decontaminated respiratory protective

equipment. Assistants will don IC approved PPE that complies with MEDCOM OPORD/FRAGO requirements (see MEDCOM OPORD 15-03, FRAGO 5, Annex E).

13.7.2.2 Decontamination Station. Establish a decontamination station.

1. Position the first waste water collection pool so that each terminal cleaner can step directly into it from the storage area.
2. Position the second pool within 5 to 10 feet of the first pool.
3. Place the chair/stool/walker and rack for PAPR next to the second collection pool.
4. Place all required supplies in the decontamination station area.
5. Line the RMW containers with red bags.
6. Load the disinfectant sprayers with disinfectant.
7. Add disinfectant to the first collection pool until approximately a ½ inch level is in the pool.
8. If approved, add dye to the disinfectant so assistants can monitor application levels.

13.7.2.3 Terminal Cleaning PPE Decontamination Procedure. Complete the following steps to decontaminate the EVD waste storage area PPE (used for terminal cleaning):

1. The terminal cleaner will spray his hands with disinfectant (sprayer already in EVD waste storage area).
2. The terminal cleaner will cap the PAPR filter units to prevent decontamination fluid from entering the filter cartridges. Keep one cartridge uncapped during the process to prevent the PAPR from changing to negative pressure by: (a) capping the two side cartridges and leaving the bottom one open, then spraying the top and sides of the PAPR (do not spray the bottom with the cartridge open; and then (b) uncapping one of the side cartridges, capping the bottom cartridge, and then spraying the bottom of the PAPR.

3. The terminal cleaner will step from the storage area into the first collection pool.
4. The assistants will spray the terminal cleaner with disinfectant starting at the head and working down to the feet.
5. Ensure full saturation of all exposed PPE.
6. The terminal cleaner will raise each foot so assistants can spray all sides and the bottom of each foot.
7. One assistant will observe a time keeping device to mark the contact time start.
8. The terminal cleaner will stand in the pool until the required contact time elapses (approximately 10 to 15 minutes).
9. The terminal cleaner will step out of the first pool and walk to the second collection pool.
10. Once in the second pool, the assistants will spray the terminal cleaner with disinfectant starting at the head and working down to the feet.
11. The terminal cleaner will begin doffing the wet PPE in the second collection pool according to IC protocols and MEDCOM OPORD/FRAGO requirements (see MEDCOM OPORD 15-03, FRAGO 5, Annex E).
12. The assistants will assist the terminal cleaner with removal of the PAPR equipment and place reusable equipment (PAPR blower, battery, belt, and hose) on the rack/hanging device to dry. Place non-reusable PAPR components (cartridges and hood) into the RMW red bag container.
13. The terminal cleaner will remove PPE and place all PPE destined for disposal in the RMW red bag container.
14. As the terminal cleaner places the PPE into the RMW bag, the assistants will spray the waste with disinfectant.
15. The terminal cleaner will change gloves according to protocol and ask for spray disinfectant to the gloves from the assistants as required.

16. Terminal cleaners will apply hand sanitizer to hands after removing all PPE and gloves.

17. Once the last terminal cleaner leaves the decontamination station, the assistants will place the stool/chair/racks and any equipment used into the second collection pool and apply fresh disinfectant to all equipment surfaces (including sprayer handles).

18. After spraying the equipment, add an additional inch of disinfectant to the first pool and an inch of disinfectant to the second pool.

19. The two assistants will take turns stepping into the second pool for PPE disinfection. The person outside of the pool will spray the person who is in the pool to disinfect the PPE top to bottom.

20. Observe a time keeping device to mark the contact time start.

21. After the contact time elapses, the assistants will doff their PPE into the RMW red bag.

22. Once all PPE is in the RMW red bag, spray the contents of the bag to saturate the content and manage according to Paragraph 13.7.3.

23. After the contact time elapses, MTF facilities or maintenance personnel will connect the pump and hoses to the collection pools and pump the decontamination liquid into the 55-gallon drum.

24. Manage the liquid disinfectant waste according to Section 12. MTF personnel may neutralize the disinfectant (add water or applicable chemicals) if required prior to discharging the drum contents into the sanitary sewer.

13.7.3 Terminal Cleaning Waste Collection. Terminal cleaning will generate solid wastes such as microfiber mop heads, microfiber cloths, outer gloves, absorbent pads, etc. Terminal cleaners will follow these steps to ensure safe disposal as RMW:

1. Line the RMW containers with red bags.
2. Position the container and red bags in the cold zone just outside the storage area after the initial dehydration step is complete.

3. Extend arms out to place all waste into the RMW container without stepping over the storage area boundary (warm zone).
4. Terminal cleaners will saturate the waste in the red bags with spray disinfectant frequently as they add wastes to the red bag during the cleaning process.
5. Once filled to 2/3 capacity, terminal cleaning assistants will spray all exposed surfaces of the red bag and RMW container with disinfectant spray.
6. One assistant will observe a time keeping device to mark the contact time start.
7. After the contact time elapses, the assistants will balloon tie, tape, or zip tie the red bag to prevent any release of material if the bag is inverted (goose-necking with tape or zip ties is permitted).
8. The assistants will hold the bag over the RMW container and spray it with disinfectant.
9. Re-line the RMW container with a red bag. This will become the secondary red bag.
10. Place the primary bag into secondary bag and balloon tie, tape, or zip tie the red bag to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted). The closure method must not tear, puncture or otherwise damage the bag.
11. Remove the secondary bag from the RMW container and while holding the bag over the trash container, treat the exterior of the secondary bag with an approved disinfectant/bleach. Allow the disinfectant to air dry. Do not spray more disinfectant than necessary to lightly mist the bag.
12. Mark the secondary red bag or the outer RMW tub/tote with the words "Treated Cleaning Waste" and a date using a label, duct tape, etc.
13. Transport the waste to the RMW storage facility according to standard RMW procedures.
14. Separate the terminal cleaning wastes in the RMW storage area and hold for five days.

15. Once the five days elapse, remove the "Treated Cleaning Waste" labels/tape and send off on the next contracted RMW pickup.

13.7.4 Final EVD Waste Handlers. After MTF personnel package EVD Waste into the outer 55-gallon shipping drums and spray all drum surfaces with disinfectant, the risk of EVD infection is very low. Waste handlers who move the sealed EVD waste drums through the MTF and/or pack them into the overpack salvage drums will require minimum PPE. Dispose of the PPE (gloves, aprons, etc.) worn to move or overpack sealed EVD waste drums as routine RMW according to established MTF procedures.

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Title 49 CFR, Parts 100-185, Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

Section II
Related Web Sites

<http://phc.amedd.army.mil/topics/discond/diseases/Pages/EbolaVirusDisease.aspx>

<http://phmsa.dot.gov/hazmat/regs/sp-a/special-permits/search>

<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>

<http://www.cdc.gov/quarantine/air/managing-sick-travelers/ebola-guidance-airlines.html>

http://www.epa.gov/oppad001/list_g_norovirus.pdf

<http://www.epa.gov/oppad001/list-l-ebola-virus.html>

<http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/ebola-eng.php>

http://www.nclonline.com/products/view/MICRO_CHEM_PLUS

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APPENDIX B
ABBREVIATIONS AND TERMS

ANSI

American National Standards Institute

AO

Area of Operation

APHC (Prov)

Army Public Health Center (Provisional)

ASTM

American Society for Testing and Materials

CBRNE

Chemical, Biological, Radiological, Nuclear and Explosives

CDC

U.S. Centers for Disease Control and Prevention

CFR

Code of Federal Regulations

cf

cubic feet

CONNEX

Container Express

cu yd

cubic yard

DA Pam

Department of the Army Pamphlet

DPW

Directorate of Public Works

DOD

U.S. Department of Defense

DOT

U.S. Department of Transportation

DOT-SP

U.S. Department of Transportation-Special Permit

EPA

U.S. Environmental Protection Agency

EVD

Ebola Virus Disease

ft

feet

IC

Infection Control

ID

identification

MEDCOM

US Army Medical Command

MILVAN

Military Demountable Container

MTF

medical treatment facility

OSHA

Occupational Safety and Health Administration

PAPR

Powered Air Purifying Respirator

PHMSA

Pipeline and Hazardous Materials Safety Administration

PPE

personal protective equipment

ppm

parts per million

RMW

Regulated Medical Waste

TIP

Technical Information Paper

UN

United Nations

USAPHC

U.S. Army Public Health Command

UV

Ultraviolet

UV-C

Ultraviolet-C

UVGI

Ultraviolet Germicidal Irradiation

WWTP

Waste water treatment plant

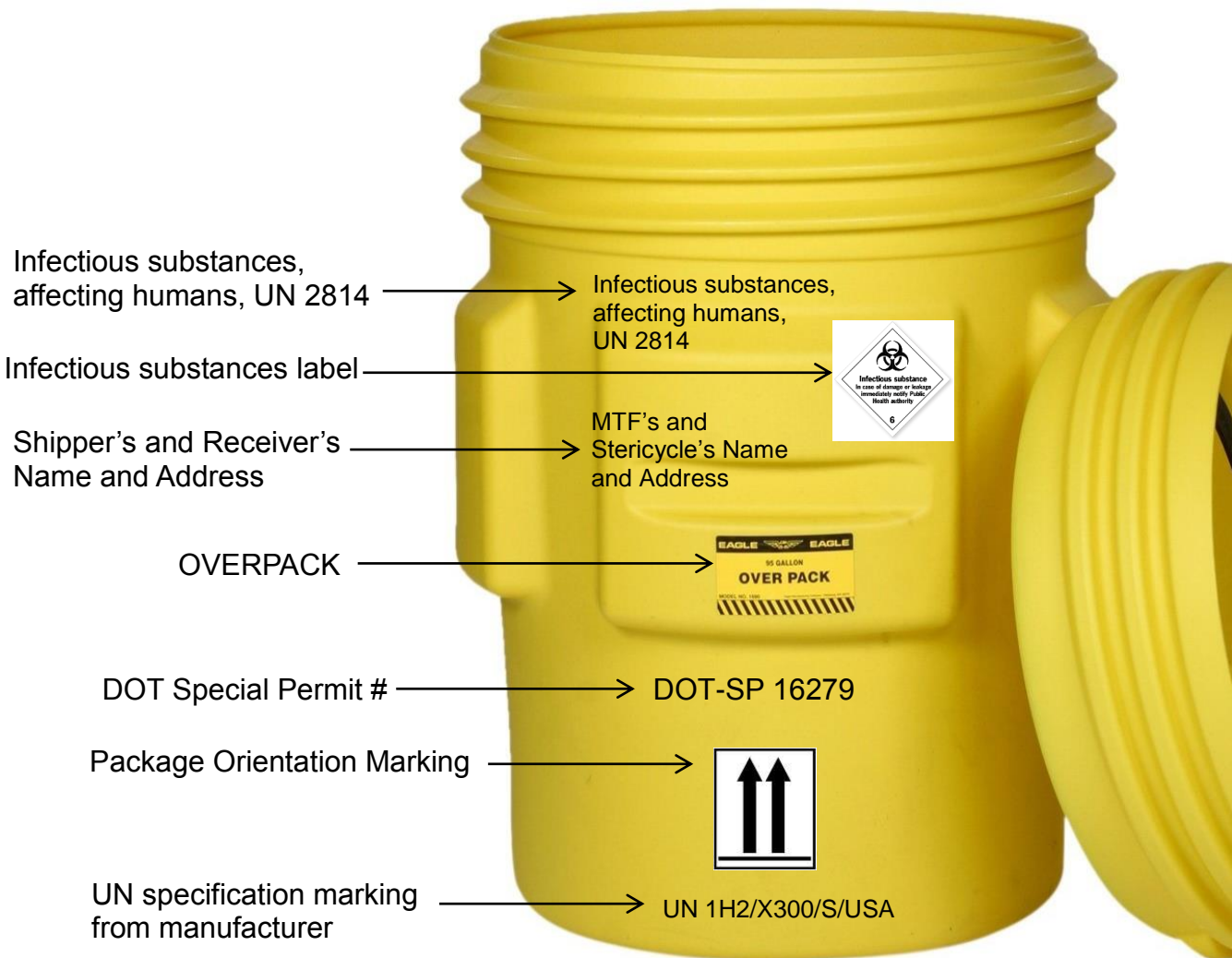
APPENDIX C

MARKINGS AND LABELS FOR CONUS HIGHWAY TRANSPORT

EVD WASTE DRUM:



OUTER OVERPACK SALVAGE DRUM WITH EVD WASTE DRUM INSIDE:



APPENDIX D

APPOINTMENT ORDER TEMPLATE FOR EVD WASTE SHIPPERS

OFFICE SYMBOL

DATE

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Appointment Orders for Ebola Virus Disease (EVD) Waste Packaging and Transport

1. REFERENCES.

- a. 49 Code of Federal Regulations (CFR) Transportation, Parts 100-185.
- b. Defense Transportation Regulation (DTR) 4500.9-R, Part II, Chapter 204.
- c. AFMAN 24-204(I)/TM 38-250/NAVSUP PUB 505/MCO P4030.19H/ DLAI 4145.3 345 11.

2. Effective immediately, the following personnel are appointed and designated as certifying officials of Division 6.2 Category A Infectious Substances Affecting Humans (Ebola Waste) in accordance with the authorities listed in paragraph 3.

NAME	GRADE/RANK	DUTY LOCATION	PERIOD	EXPIRATION DATE
xxxxxxx	GS-??	Env Services (Primary)	9 Months	
xxxxxxxxx	GS-05	Lab (Alternate)	18 Months	

3. AUTHORITY. Department of Transportation (DOT), Defense Transportation Regulation (DTR) 4500.9-R, Part II, Chapter 204, and AFMAN 24-204(I)/TM 38-250/NAVSUP PUB 505/MCO P4030.19H/ DLAI 4145.3 345 11.

4. PURPOSE. To implement and execute the details associated with the appointed position and/or special emphasis area(s) to ensure Ebola waste is packaged IAW all respective transportation standards for Category A Infectious Substances Affecting Humans including provisions of DOT-Special Permit 16279 and that shipping papers are properly prepared, managed, and retained in accordance with 49 CFR Parts 100-185, Subchapter C. The above appointees hold certifications from either the DOD-approved USAPHC Transport of Biomedical Material Course or the 80-hour Defense Hazardous Material Packaging for Transport Course.

5. PERIOD. Until reassigned, relieved of these duties, or the expiration date of the appointee's DOD required initial or refresher training certification as specified. This appointment is not to exceed 24 months or the appointee's period of employment.

6. DUTIES. Shippers are accountable for ensuring the appropriate classification, packing, marking, labeling, handling, and signing of shipping papers for Category A Infectious Substances Affecting Humans (Ebola waste). All personnel appointed to prepare EVD waste for transport at XXXXX Army Community Hospital are knowledgeable of and able to comply with regulatory requirements, policies, and special emphasis areas which include: the Department of Transportation, International Maritime Dangerous Goods, International Air Transport Association's Dangerous Goods regulations, and applicable Army policies and procedures on the safeguarding, handling, and controlling of EVD waste. Personnel are trained on actions required to prevent or correct any potential hazards to persons and the environment during EVD waste transport if material spills. Individuals identified under this appointment will also validate EVD waste collection, segregation, and packaging procedures (primary and secondary red bagging procedures and outer drum packaging).

7. SPECIAL INSTRUCTIONS. Patient care procedures dictate that clinical care personnel and EVD waste movement personnel will conduct the primary, secondary and final packaging steps for EVD waste with validation from the signing official. The procedures are in place for the protection of all personnel. Appointed EVD waste shippers will validate as necessary to ensure the proper packaging requirements are achieved in the hospital.

8. The point of contact for this memorandum is the undersigned at (xxx) 798-8041/DSNxxx-xxxx.

COL, MC
Commanding

DISTRIBUTION:

Commander

DCA

DCCS

Chief, Preventive Medicine

Chief, Logistics

CF:

Individuals

APPENDIX E

EVD WASTE PACKAGING CHECKLIST

	EVD Waste Packaging Steps	Yes	NA
Red Bag Waste			
1	Line trash cans/waste receptacles with approved red bags		
2	Place all waste in either red bags or sharps containers, as appropriate.		
3	Fill red bags to 1/2 - 2/3 capacity.		
4	Do not compact bags.		
5	Place sharps containers in EVD waste red bags when changed out for disposal.		
6	Spray bleach (1:10 solution) or EPA-registered, hospital approved disinfectant into the primary red bag to sufficiently cover the surface of materials contained in the bag.		
7	If a sharps container is in the red bag, sufficiently cover the exterior of the sharps container.		
8	Balloon tie, tape, or zip tie the red bags to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted).		
9	While holding the red bag over the container it was in, treat the exterior of the primary bag with approved bleach/disinfectant. If it was not in a container or is too heavy, place an absorbent pad down to capture drips from the sprayed bag, place the bag on the pad and spray. Dispose of the absorbent pad as EVD waste.		
10	Line a large trash can/waste receptacle with an approved red bag. This bag will become the secondary red bag.		
11	Place the primary bag into secondary bag and balloon tie, or tape, or zip tie the red bags to prevent the release of any material from the bag if inverted (goose-necking with tape or zip ties is permitted). The closure method must not tear, puncture or otherwise damage the bags.		
12	Remove the bag from the trash container and while holding the bag over the trash container, treat the exterior of the secondary bag with an approved disinfectant/bleach. Allow the disinfectant to air dry. If necessary, set the red bag on an absorbent pad to capture drips off the bag—do not spray more disinfectant than necessary to lightly mist the bag. Dispose of the absorbent pad as EVD waste.		
13	Mark the secondary red bag with the words "EVD Waste" using a label, printed paper, etc.		
14	Place the disinfected secondary red bag into the collection cart and move the waste to the EVD storage area for drum packaging. Note: Personnel can package the red-bagged waste directly into the EVD waste drum in the treatment area if preferred.		
15	Go to Three-Day Hold procedure steps if necessary.		
16	Continue to Outer Drum Packaging steps to complete the packaging.		

EVD Waste Packaging Steps		Yes	NA
Three-Day Hold Procedure –			
Note: personnel may skip these steps and go straight to the outer drum packaging steps			
1	Place the red-bagged waste into an RMW tote/tub and close the lid. One tote will hold approximately 2 – 3 completed double red bags.		
2	Mark the outside of each tote/tub with the words “EVD waste”, a date, and a link to the patient such as treatment room number, sequential order of the number of patients - #1, 2, 3, etc. Use a labeling method that personnel can easily remove such as duct tape, labels, etc.		
3	If the onsite treatment laboratory comingles specimen wastes from all suspected EVD patients, mark the tote with “Lab” to indicate it came from the EVD laboratory. One positive patient will make all red-bagged lab waste positive if comingled.		
4	Transport the sealed totes/tubs to the EVD waste storage area and hold until the final diagnosis.		
5	Position the totes in the EVD waste storage area according to date and patient ID for ease of follow-up packaging as EVD waste or downgraded RMW.		
6	If a patient is positive, don IC approved PPE, take the red bags out of the tubs, and complete the outer drum packing procedure in the EVD waste storage area.		
7	If the patient is negative, remove the EVD label on the tote/tub and transfer the waste to the RMW storage area. Remove the tie tags, labels, or papers used to mark the secondary red bags with the words “EVD Waste”. Dispose of the waste as routine RMW.		
8	Hold totes/tubs from positive patients in the EVD waste storage area until personnel disinfect them. After disinfection, return them to the RMW tote/tub supply area.		
Outer Drum Packaging			
1	Open the drum and remove liner and zip tie		
2	Line the drum with the 6-mil liner		
3	Place an absorbent spill pad or absorbent material inside the 6-mil liner. Note: the EVD waste drums (“Green Drums”) do not include the required absorbent materials/pads.		
4	Place double red-bagged waste into the lined drum.		
5	Securely tie the liner, and close the container per the packaging instructions provided with the drum.		
6	Treat (spray or wipe) the entire outer surface of the drum with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7) and allow it to air dry. Do not over saturate the corrugated fiberboard drum with disinfectant to prevent damaging the integrity of the drum.		
7	Affix the special Category A DOT waste labels provided by Stericycle.		
8	Secure the drums in the dedicated EVD waste storage area until the Stericycle truck arrives to pick up the waste.		
9	Go to overpack salvage drum steps.		
Overpack Salvage Drum			
1	Contact MEDCOM Environmental to coordinate purchase of the overpack drums after positive EVD diagnosis.		

	EVD Waste Packaging Steps	Yes	NA
2	If fork trucks or other mechanical means are required for loading the packed salvage drums onto the truck, contact the DOT according to Paragraph 6.3.2.1 and provide the intended equipment, use, and location.		
3	Utilize a secure area near or on the loading dock to complete the overpacking process.		
4	Do not place the overpack salvage drums in an EVD contaminated area.		
5	Place each packed and sealed EVD waste drum into an approved overpack salvage drum (see Paragraph 5.4 for drum specifications).		
6	Apply tape to secure the lid to the overpack salvage drum and prevent tampering.		
7	If the overpack salvage drum enters an EVD contaminated area, treat (spray or wipe) the entire outer surface of the drum with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7). Allow the drum surface to air dry.		
8	Affix the required special Category A DOT waste labels and markings to the overpack salvage drum (see Appendix C).		
9	Maintain security of the area until all drums are loaded onto the truck for transport.		
10	Operate fork trucks or other mechanical means with extreme care to prevent puncture or rupture of the package.		
Large Article Packaging – Items that will not fit in red bags and drums			
1	Disinfect the entire surface of the article with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).		
2	Enclose the item in two layers of plastic sheeting that is marked and certified as passing the tests prescribed for the inner red bags (see Paragraph 3.3.1.1).		
3	Seal the large article inside the first plastic sheet with the opening (ends) twisted closed.		
4	Seal all seams with at least two wraps of duct tape.		
5	Seal all other openings with at least two wraps of duct tape or two ZIP-TIES to insure closure of the wrap.		
6	Disinfect the outer surface of the wrapped article with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).		
7	Repeat steps 3, 4, and 5 with the second sheet of plastic.		
8	Disinfect the outer surface of the wrapped article with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).		
9	If practical, package the wrapped article in a 95-gallon, UN1H2-salvage drum certified at a minimum PG II performance level. After filling the drum, seal and securely close the drum. After closing, apply tape to the drum to secure the lid and prevent tampering.		
10	If the item is too large to package in a 95-gallon salvage drum, seal the wrapped article in a 6-mil polyethylene sheet and completely enclose the item. Securely seal all seams with tape so material cannot escape.		
11	Disinfect the outer surface of the plastic sheet with an EPA-registered, hospital approved disinfectant or a 1:10 solution of bleach (see Paragraph 1.7).		
12	Repeat steps 10 and 11 with another sheet of plastic.		
13	Affix the required special Category A DOT waste labels and markings to the outer plastic sheet (see Appendix C).		

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