



## WHITE PAPER

April 7, 2022

TO: FIRESCOPE Board of Directors

FROM: FIRESCOPE Ops Team, Task Force & Hazardous Materials Subcommittee

SUBJECT: Decontamination Unit/Cache Typing and SEL

REQUESTED ACTION: The FIRESCOPE Hazardous Materials Subcommittee, Task Force, and Operations Team request the FIRESCOPE Board of Directors to approve the recommendations as outlined in this White Paper regarding Decontamination Unit/Cache Typing and a Standard Equipment List.

APPROVAL: The FIRESCOPE Board of Directors approved the requested action on April 7, 2022.

### **SUMMARY**

Decontamination after an exposure to a substance is not a new concept. Hazardous Materials Teams have been performing this function to remove product from themselves after entry since the fire service entered the Hazmat arena. Decontamination of a mass number of civilians has become a concern since 9/11. Concerns of terrorist attacks, failures of chemical facilities, and pesticide over sprays have occurred. In these instances, and others, large numbers of civilians and rescuers have required the decontamination process. Mass Decontamination response purview has been the view of individual agency needs. Each agency has in turn developed their own capabilities to meet those needs. Considering such need, FIRESCOPE has developed this Mass Decontamination Typing, SEL, and the minimum staffing levels of the typed decon units. This document does not include the overall staffing levels based on the complexity of the assignment and or duration. To date, there is no such typing system or method for request, expectations, etc. in place.

### **RECOMMENDATIONS**

#### **MASS DECON TYPING SUB GOALS**

It is expected that in most cases, patients will go through traditional gross decon prior to the need for secondary decon with soap and warm water. In no case should a patient's care be delayed while secondary mass decon equipment is assembled.



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Codify existing equipment statewide for the purpose of interagency mutual aid in the event of Mass Decon needs. This SEL and capability exists in agencies across the state. This typing program will support the existing equipment and allow for the deployment of units across jurisdictional lines. This typing program is designed to be attainable and sustainable over time.

- Identify minimum standards for equipment
- Identify minimum quantities of equipment
- Identify minimum capability for each Type

### **MASS DECON TYPING GOAL:**

Create a tiered Mass Decon Typing system that uses a Standardized Equipment List to match the appropriate needs of an agency with the capabilities of a thoroughly equipped Mass Decon cache. The tiered Decon units will deploy and operate as support to local FRO/Decon trained fire department members.

### **Goals of patient decontamination**

- Achieve an improvement in patient's acute health outcomes by reducing morbidity and mortality.
- Achieve an improvement in patient's long-term health outcomes by preventing delayed morbidity.
- Protect the health and functioning of the health care system by preventing secondary contamination of responders, receivers, and infrastructure.
- Assure the best health outcome for the most patients. This might result in a departure from the current paradigm by allowing for decontamination to a less than complete level but aims to provide everyone with timely decontamination so that:
  - Those patients requiring supportive or definitive medical care receive it at the appropriate time; and
  - The majority of minimally exposed patients may be able to bypass medical evaluation, preserving medical resources for those with the most urgent needs.
- Provide secondary decon using an appropriate decontamination method for patients that require additional decontamination.

### **MASS DECON TYPING LEVELS:**

Decontamination Unit caches are designed as an all-hazard platform to respond as needed. Decon Units at each level must at a minimum be capable of performing mass decontamination while addressing all the following concerns:



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- Care for ambulatory and non-ambulatory patients.
  - An equipment assembly that can allow patients to move through decon supine and/or prone.
- Have systems in place to implement warm water decon
  - A flash heater or equivalent that can render all water associated with decon to a temperature of 77 degrees Fahrenheit or greater.
  - Carry sufficient blankets or equivalent to care for patient's post decon.
- Have sufficient equipment to contain the runoff of water used in decon
  - This equipment will collectively contain runoff from the point of contact with all persons going through decon.
- Address the modesty concerns of all persons that go through decon
  - Decon corridors must provide a visual barrier while persons go through decon.
  - **MODESTY CLOTHING:** Usually lightweight disposable Tyvek® or equal, an array in various sizes; Complete with booties or foot protection.
  - Address the personal property concerns of all persons that go through decon.
  - **PERSONAL PROPERTY TRACKING:** Kit to consist of forms, tags, receipts, sealable baggies, labels, etc., to document personal property collected such as jewelry, wallets, pagers, cell phones, and documents personal information of owner.

<b>TYPE I</b>	<b>TYPE II</b>	<b>TYPE III</b>
1000 persons	500 persons	250 persons

- Type 1: Ability to perform Mass Decon on a large scale.
  - Teams will be able to perform:
    - Mass Decon for 1000 persons or more as per agency requirements.
    - Carry sufficient quantities of equipment listed above to accomplish the goals above.
- Type 2: Ability to perform Mass Decon on a medium scale.
  - Teams will be able to perform:
    - Mass Decon for 500 persons.
    - Carry sufficient quantities of equipment listed above to accomplish the goals above.



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- Type 3: Ability to perform Mass Decon on a small scale.
  - Teams will be able to perform:
    - Mass Decon for 250 persons.
    - Carry sufficient quantities of equipment listed above to accomplish the goals above.

### Recommended Capability Chart:

Type 1	Type 2	Type 3
1000 Persons	500 Persons	250 Persons
12 Lanes	6 Lanes	3 Lanes

### MASS DECON RESPONSE EXPECTATIONS

It is the general expectation that agencies who choose to outfit any of the three standardized equipment caches will respond with two **(2)** members to operate the vehicle and safely deploy the cache of equipment. These two members will join with additional staffing to operate the described number of lanes of the mass decon system.

A Type 1, Type 2, or Type 3 Mass Decontamination Unit is not intended to be deployed as a stand-alone resource. They require that a Typed HazMat Team and a Task Force of resources that are capable of pumping, be deployed with them as part of a Task Force to be effective. The Task Force can be composed of units from a single agency or multiple agencies. The typed HazMat Team that responds shall be appropriate for the hazards encountered. CAL OES typed HazMat resources will safely respond to Unknown Chemicals/WMDs, Unknown Chemicals, or Known Chemicals. Matching the appropriate Typed HazMat team to the Mass Decon Unit is essential for responder safety.

### STAFFING

Additional staffing requests is needed beyond the (2) personnel assigned and will be based on situational awareness and overall incident objectives. For example, non-ambulatory patients contaminated with a persistent chemical will require a significantly larger staffing component than ambulatory patients contaminated by a soluble liquid. Incident commanders shall adjust resource deployment based on the needs of the incident.

The primary difference between Mass Decontamination cache types is the total number of patients that they can provide decontamination for. All Decontamination



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cache types are expected to be able to perform decontamination for WMD incidents involving chemical, biological, or radiological materials. All Mass Decontamination types have a minimum staffing of two (2) personnel that are familiar with the equipment they are bringing. They will be relied on to operate the tents and/or trailers that they bring to the incident. The Typed HazMat Team will provide various overhead positions to support the decontamination operation. They also bring personnel that are trained to be able to safely handle the chemicals involved and provide decontamination method recommendations. The intent is that they guide the other personnel assigned to the Decon Unit. The Typed HazMat Team also brings numerous detection capabilities to assist with validating that the decontamination methods in place are effective. The detection capabilities can also be deployed to monitor the worksite and keep personnel working in the area safe.

Additional resources will be required for staffing and pumping. Engine companies are needed to support the operation. They will be utilized to staff the decontamination lanes and help guide ambulatory patients through the process. Engine companies will also be needed to provide decontamination to non-ambulatory patients. Members assigned to this task will be required to perform FRO level skills.

### *Mass Decontamination Principles:*

- Time is critical to save the most lives.
  - The immediate removal of clothing outside the contaminated area for patients who have been visibly contaminated or who have been suspected of having been contaminated and
  - Processing the victims through a high-volume, low-pressure water shower (~50 to 60 psi) is a priority. This may aid in the removal of 80-90% of physical contamination in almost all cases.
- Provide effective mass casualty decontamination. Other activities, such as setting up commercial decontamination tents, tarps, additional decontamination equipment, and/or creating a soap-water solution should be accomplished when time permits.
- Conduct decontamination triage prior to administering a high-volume, low-pressure water shower.
- When the contamination involves chemical vapors, biological or radiological material, using gentle friction (such as rubbing with hands, cotton flannel or microfiber cloth, or sponges) is recommended to aid in removal of contamination. Rubbing should start with the head and proceed down the body to the feet. Extra care should be taken to prevent the spread of contamination to the mouth, nose, and eyes (such as holding one's breath to avoid inhalation/close contact with mucosa and closing one's eyes while



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wiping the face and head). The key to successful mass casualty decontamination is to use the fastest approach that will cause the least harm and do the most good for the majority of the people. Coordination of initial assessment and ongoing observation procedures is critical to ensure that the health needs of victims continue to be met as the incident evolves.

### Mass Decon Response Expectations:

The following chart represents reasonable expectations for incident objective completion based on the lanes described and staffing provided in this document. This formula stays consistent with each Typing level. The recommended minimum wash time is taken from the Edgewood Chemical Biological Center guidance:

A three (3) minute wash time per patient equals 4.2 hours (250 minutes) to complete the objective.
Recommended minimum thirty (30) second wash time per patient equals forty two (42) minutes to complete the objective.

### **MASS DECON STANDARDIZED EQUIPMENT LIST**

#### 1.1 Rescuer Related Tools & PPE

The following tools and PPE are designed to be stored and transported in such a manner that it is available for the staffing required based on the lanes in operation. Responding agencies will be required to equip their members with appropriate PPE based on the mission at hand. Examples of this additional PPE could include Respiratory Protection and communication equipment. This list of PPE will allow responders to staff the appropriate number of lanes and perform FRO level decon at scale.

<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
1.1.1	<b>SUIT, LIMITED USE, Splash Protective Suit, NFPA 1992:</b> With at least bond or sealed seams (not simple stitch or surged); Liquid tight zipper.	40	20	10



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<i>Inv.#:</i>	Item Name and Description	Type I Required Minimum	Type II Required Minimum	Type III Required Minimum
1.1.2	<b>CHEMICAL RESISTANT TAPE:</b> Roll of chemical resistant tape to be used with 1.1.1 if needed.	2	2	1
1.1.3	<b>REPLACEMENT GLOVES, Liquid Splash Protective:</b> Compliant to NFPA Standard 1992.	24	12	6
1.1.4	<b>BOOTS, CHEMICAL RESISTANT:</b> For use with Liquid Protective garments.	24	12	6
1.1.5	<b>BOOTIE, OUTER PROTECTIVE:</b> Disposable chemical protective bootie slip-over that covers entirely a General Work Safety Boot for use in low threat level contamination environments.	24	12	6
1.2.1	<b>RADIO, PORTABLE, Walkie Talkie</b> style, with carrying case, and appropriate support hardware to be worn on person.	2	2	2
1.2.2	<b>RADIO, PORTABLE, Headphone Set or Remote Speaker Mic:</b> Complete with RSM, boom mic, ear mic, bone mic, or throat mic, and necessary attachable hardware to walkie talkie.	2	2	2



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
1.2.3	<b>RADIO, PORTABLE, Interchangeable battery:</b> Two batteries assigned per unit, the second set for back-up.	2	2	2
1.3.1	<b>CLOTHING REMOVAL TOOLS:</b> Such as scissors, shears, etc.	12	6	3
1.3.2	<b>DRY DECON TOOL:</b> A wiping tool designed for dry decon. Some products come in wipe form.	Recommended 6	Recommended 4	Recommended 2

### 2.1 Patient Related Tools & Equipment

<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
2.1.1	<b>PERSONAL PROPERTY TRACKING:</b> Kit to consist of forms, tags, receipts, sealable baggies, labels, etc., to document personal property collected such as jewelry, wallets, pagers, cell phones, and documents personal information of owner.	1000 Kits	500 Kits	250 Kits
2.1.2	<b>BLANKETS, DISPOSABLE:</b> Lightweight, disposable, paper or space blanket type. Often included in 2.1.1. kits.	1000	500	250





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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
2.2.1	<b>CLOTHING, MODESTY:</b> Usually light weight disposable, an array in various sizes; Complete with booties or foot protection. Often included in 2.1.1 kits.	1000	500	250
2.2.2	<b>TOWELS, ABSORBENT, DRYING:</b> Commercial laundry towels, cotton, approximately 20"x 40". Often included in 2.1.1.	1000	500	250
2.2.3	<b>CADAVER BAGS:</b> Non-transparent.	Recommended 15	Recommended 10	Recommended 5

### 3.1 Mass Decon Tools

The following mass decon tools are recommended to accomplish the stated goals and number of persons outlined in the beginning of this document. Agencies will need to determine the appropriate number of systems based on their predicted capabilities and expected deployment of personnel.

<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
3.1.1	<b>DECON LANE DEVICE:</b> Portable, inflatable, or expandable type. Some products come as a tent. Some products are custom built trailers. Any combination that meets the required lanes will suffice. Must carry sufficient systems to accomplish the described number of lanes.	12 Lanes	6 Lanes	3 Lanes



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
3.1.2	<b>SHELTER TENT ANCHOR SYSTEM:</b> A system that protects the shelter from collapsing in windy conditions. Only required if recommended by the manufacturer.	1 Per 3.1.1	1 Per 3.1.1	1 Per 3.1.1
3.2.1	<b>NON-AMBULATORY PATIENT MOVEMENT DEVICE:</b> Some type of device that allows non ambulatory patients to move through the Decon process. An example of this device is a patient roller that spans the Decon area. Can be included in 3.1.1.	4 Per Team	2 Per Team	1 Per Team
3.2.2	<b>COLLAPSIBLE STRETCHER:</b> A collapsible stretcher that can allow non ambulatory patients to move through decon.	12 Per Team	6 Per Team	3 Per Team
3.3.1	<b>FAN SYSTEM:</b> A misting system that can provide the movement of air and a misting ability during extreme weather conditions.	Recommended only	Recommended only	Recommended only
3.3.2	<b>GROUND COVER:</b> Large Tarp used for ground cover. Usually, 12' x 18' in size. Rolled plastic of similar size may be used.	12 Per Team	6 Per Team	3 Per Team



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
3.3.3	<b>LIGHTS:</b> Lighting system that is sufficient to provide lighting in the Mass Decon Contamination Reduction Zone and Support Zone if needed.	Recommended only	Recommended only	Recommended only
3.3.4	<b>BARRIER TAPE:</b> Sufficient Barrier Tape to mark off hazard zones, and direct patients and rescuers.	8 Rolls	4 Rolls	2 Roll

### 4.1 Containment

<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
4.1.1	<b>TRAFFIC DELINEATORS, Ordinary:</b> high visibility fluorescent in nature. Of a height that can be used to create lanes as needed. Typically, between 36" and 42" in height.	24	12	6
4.1.2	<b>TRAFFIC CONES, Ordinary:</b> Minimum 18" in height, high visibility fluorescent in nature.	24	12	6
4.2.1	<b>BUCKETS:</b> Ordinary plastic, 5-gallon capacity, with or without lids.	12	6	3



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4.2.2	<p><b>BAGS, HEAVY DUTY YARD, Large:</b> Approximately 32" wide x 48" long, 3 mil thick, 42-gallon capacity, with tie straps or loc-ties.</p>	20	12	6
4.2.3	<p><b>BAGS, HEAVY DUTY YARD, medium:</b> Approximately 28" wide x 36" long, 3 mil thick, 33-gallon capacity, with tie straps or Joe-ties.</p>	1000	500	250
4.2.4	<p><b>DEBRIS COLLECTION UNIT:</b> 35-to-65-gallon capacity, light duty, and light weight polyethylene drums, or collapsible mylar drum liners; Suitable for collection of debris and soiled clothing only.</p>	1 Per Team	1 Per Team	1 Per Team
4.2.5	<p><b>DRUM, LINER, 55 to 95 Gallon:</b> Heavy duty polyethylene</p>	6 rolls of 100	3 rolls of 100	2 rolls of 100
4.2.6	<p><b>TRANSFER PUMP:</b> Mechanical or electric pump meant for the transfer of water associated with decon from catchment areas into additional containment bladders.</p>	1 Per Team	1 Per Team	1 Per Team
4.3.1	<p><b>CONTAINMENT BASIN:</b> Sufficient system to contain runoff based on expected GPM flow.</p>	1 Per 3.1.1	1 Per 3.1.1	1 Per 3.1.1



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### 5.1 Water requirements

<i>Inv.#:</i>	Item Name and Description	Type I Required Minimum	Type II Required Minimum	Type III Required Minimum
5.1.1	<b>BRUSHES, LONG HANDLE, STIFF BRISTLE:</b> Toilet type: approximately 16" long, with stiff bristles	12	6	3
5.1.2	<b>BRUSHES, SHORT HANDLE, SOFT BRISTLE:</b> Carpenter type, synthetic bristles	12	6	3
5.1.3	<b>BRUSHES, LONG HANDLE, SOFT BRISTLE:</b> Soft bristled wand type brush, with fixed or adjustable handle to 3 feet minimum. May come with garden hose connection to supply a flow of water at brush end. Can be used in lieu of 5.1.1.	12	6	3
5.1.4	<b>SPONGE, SET:</b> Approximate size 3 to 5 inches wide by 4 to 6 inches long x 2-4 inches deep.	12	6	3
5.2.2	<b>TOWELS, ABSORBENT, DISPOSABLE:</b> Paper towels, usually in rolls.	4 Rolls	2 Rolls	1 Rolls
5.3.1	<b>SOAP, SOFT, Hypoallergenic, Liquid:</b> In dispense containers.	12 Gallons	6 Gallons	3 Gallons



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
5.3.2	<b>CHEMICAL DECOM:</b> A commercially available decon product specific to CWAs and other hazards. Some products come in wipe form; some products come as a multi-part solution.	Recommended	Recommended	Recommended
5.4.1	<b>ADAPTORS, 2 ½ to 1 ½ and 1 ½" to Garden Hose Reducer(s):</b> Appropriate hose adapters that match fire service hose with standard thread garden hose. Item 5.4.2 may have this feature-built in.	4	2	1
5.4.2	<b>MANIFOLD FIRE HOSE, HEAVY DUTY:</b> All metal construction or plastic construction (steel/bronze) with one 1 ½" female fire hose inlet swivel coupling, and four three to six brass ¾" garden hose discharge ball gates valves.; Tested to 250 psi; Mountable on a sturdy platform.	4 of 5.4.2 OR 5.4.3	2 of 5.4.2 OR 5.4.3	1 of 5.4.2 OR 5.4.3
5.4.3	<b>MANIFOLD FOR GARDEN HOSE:</b> All metal or plastic construction with one ¾" garden hose inlet swivel coupling, and three to six ¾" garden hose discharge valves.			



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
5.4.4	<b>HOSE, GARDEN:</b> May be approximately 12' to 24' lengths.	8	4	2
5.4.5	<b>HOSE, GARDEN, SHUT-OFF, In Line:</b> Separate detachable and replaceable ¼ - turn valve. Might be attached to and included with the car wash applicator, 5.1.4.	12	6	3
5.4.6	<b>APPLICATOR, NOZZLE, Garden Hose Adjustable:</b> Wash/ Spray Nozzles	12	6	3
5.4.7	<b>WRENCH, HYDRANT, UNIVERSAL:</b>	1 Per Team	1 Per Team	1 Per Team
5.5.1	<b>APPLICATOR, PRESSURE, Garden Sprayer:</b> Hand Pressurized pump sprayer.	1 Per Team	1 Per Team	1 Per Team
5.6.1	<b>FLASH HEATER:</b> Portable heater designed to raise water used in Secondary Mass decon to greater than 77 degrees Fahrenheit.	1 Per Team	1 Per Team	1 Per Team
5.6.2	<b>FLASH HEATER FUEL:</b> Sufficient Fuel for the Flash Heater component to operate for a twelve-hour operational period.	1 Per 5.6.1	1 Per 5.6.1	1 Per 5.6.1



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<i>Inv.#:</i>	<b>Item Name and Description</b>	<b>Type I Required Minimum</b>	<b>Type II Required Minimum</b>	<b>Type III Required Minimum</b>
5.6.3	<b>WATER PUMP:</b> A pump capable of moving sufficient water for the number of tents, manifolds, and water systems needed based on the number of patients expected. A Fire Pumping Apparatus can fulfill this requirement.	1 Per Team	1 Per Team	1 Per Team

### **IMPLEMENTATION PLAN**

This document outlines a set of equipment that exists in various forms statewide. This Equipment List can serve to codify existing sets of equipment and render them deployable in the all-hazard risk environment. Agencies that choose to implement a purchasing plan based on target hazards in their jurisdiction can follow the recommendations of this document at the scale appropriate for their agency. Initial inspection and re-inspection of the Mass Decon Units will follow the established CAL OES inspection cycles.

### **FINDINGS**

Several attempts have been made to quantify this ability over the last several decades. This document and its associated equipment caches will fill a hole in the response ability that exists in the Master Mutual Aid system. While the Fire Service has a standing mechanism to ask for other typed resources, this ability does not yet exist. The ability to augment this equipment cache with additional resources and personnel power is readily available Statewide.

### **CONCLUSION:**

This standardized equipment list represents a unique cache of mobile equipment that is mission ready for the all-risk hazard abatement. This set of equipment will enhance existing capabilities and provide the unique ability to perform thorough mass decon. The tiered system will allow agencies to select the appropriate Typed team for a specific mission should it be required to place a request to do so. Having this system in place will improve the efficiency and response to such incidents for the California Fire Service and those we serve.

Board of Directors Approved: April 7<sup>th</sup>, 2022