

# Instruction Sheet on the practical implementation of Guideline 10-04 "Decontamination during operations involving hazardous substances"

Short title: Practical implementation of decontamination

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Change history:

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**Replaces: Version 3 (February 2018)**

**First version: May 2006**

Significant changes:

- Editorial changes
- Adaptation to the terms of the updated FwDV 500

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## Note

A spelling that does equal justice to all genders is desirable. However, since corresponding newer spelling generally lead to major restrictions in readability, this has been dispensed with. Thus, for the entire document, the masculine form includes all genders unless explicitly stated otherwise.

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## 1. Purpose of the Instruction Sheet

This Instruction Sheet supplements vfdb Guideline 10-04 "Decontamination during operations with NBC hazardous substances" from November 2022. The guideline contains framework recommendations and shows the basic tactical and strategic procedure for decontamination. However, it does not contain any specific instructions for action.

The contents of vfdb Guideline 10-04 must therefore be implemented technically and tactically by the respective task organisations on site. This Instruction Sheet serves as an aid for the selection of suitable equipment and suggests tactical procedures for ensuring professional and sufficient decontamination in accordance with Fire Service Regulation 500 (FwDV 500).

## 2. Implementation of decon levels I to III

### 2.1. Decontamination level I: Immediate decontamination (immediate decontamination)

At least two emergency personnel are required for the immediate decontamination of three to four people (e.g. one team plus one contaminated person).

**It must be possible for every water-carrying vehicle to provide immediate decontamination.**

For example, at least the following equipment is required for three to four people to be decontaminated:

- Skin cleanser (e.g. in a hand dispenser),
- Skin disinfectant with the broadest possible spectrum of activity,
- Paper towels or cotton cloths for dabbing and
- Rescue foils (gold/silver) for makeshift clothing (heat retention).

Immediate decon must not be confused with standard decon (decon level II)! In the event of a human rescue, the incident commander may authorise exceptions in accordance with FwDV 500.

### 2.2. Decontamination level II: Standard decontamination

Decon level II requires a staffing level of at least 1/5 (decon squadron) with access to a water-carrying vehicle. As a rule, it makes sense to set up a separate *decon* section.

At least the following positions are to be filled:

1 squadron leader (StF)	Determines the location of the decon station in consultation with the incident commander, allocates the decon personnel and orders special decon measures if necessary. Ensures the proper packaging, documentation and labelling of contaminated material or, in cooperation with the responsible authorities and the incident commander, the proper cleaning and/or preparation for disposal. As a rule, he is also the <i>decon</i> section leader.
1st squad (Decon unit)	Set up the decon station. He is then deployed in the <b>black area (red/yellow zone)</b> of the decon station, takes over the cleaning and, if necessary, assists with undressing from the protective clothing.
2nd squad (Barrier team)	Marks the decon station and provides lighting if required. It is used in the white area (green zone) of the decon station and is responsible for contamination detection during A-decon.

Machinist (Ma) Supports, operates and monitors units and devices. Supports the documentation if necessary.

In a decontamination level II, the persons to be decontaminated can only pass through the stations of the decontamination station one after the other.

Especially if there are several contaminations (e.g. A and C), a group (1/8) or an extended group (1/11) should be available so that the decontamination of one person does not exceed ten minutes.

If protective clothing of Forms 2 or 3 in accordance with FwDV 500 is carried on fire-fighting vehicles for carrying out initial measures and supplementary measures, it is recommended that Decon Level I be extended by at least the following practically tested equipment:

- a device for dispensing water,
- ABEK2P3 filter (or PA) with breathing connection,
- Contamination protection gloves (latex gloves are not suitable!) and
- a larger plastic tarpaulin (at least 4 x 4 metres).

This does not release them from the obligation to install a decon area in accordance with level II of FwDV 500. Corresponding regulations must be taken into account in the conceptual pre-planning of the operation.

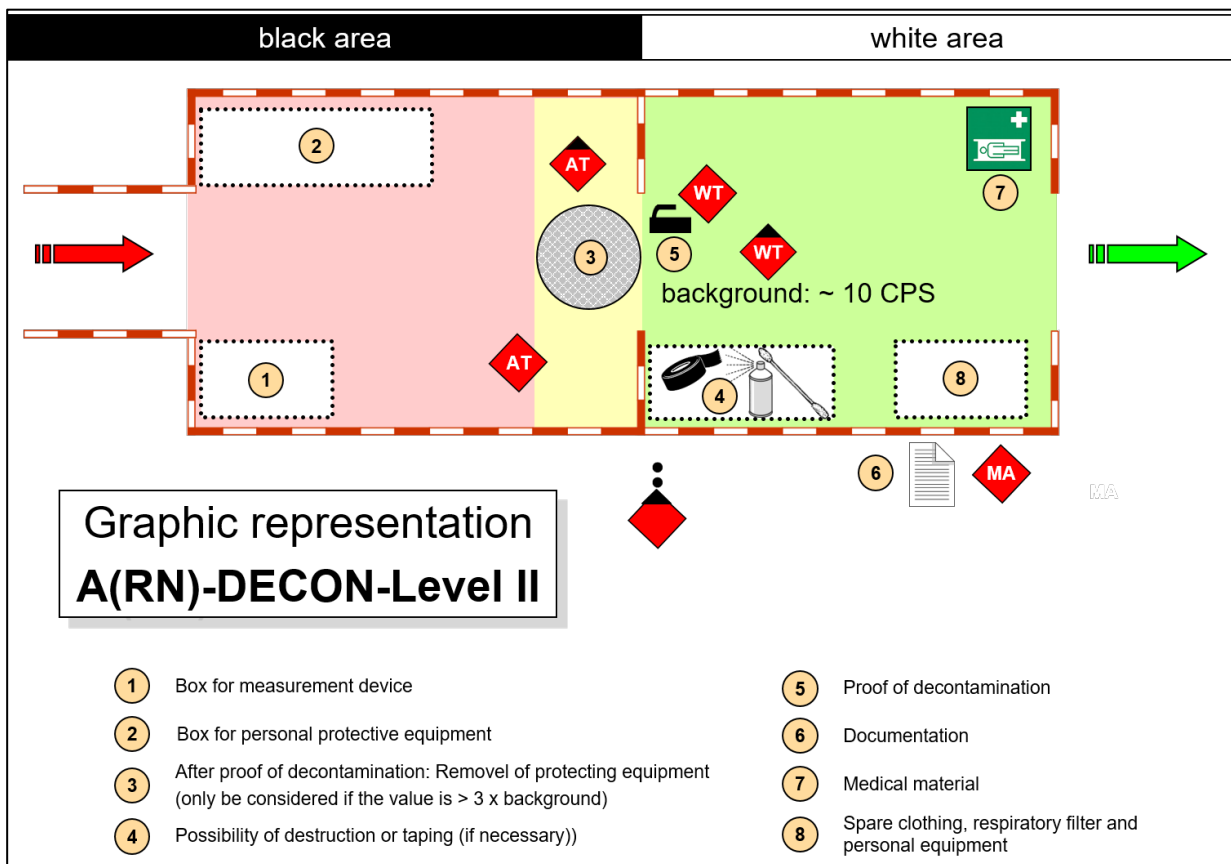


Figure 1 and Figure 2 show examples of the complete implementation of decon level II separately for A and BC operations as well as the distribution of tasks in the squadron.

For injured persons (Decon V), the principles of immediate decon also apply here!

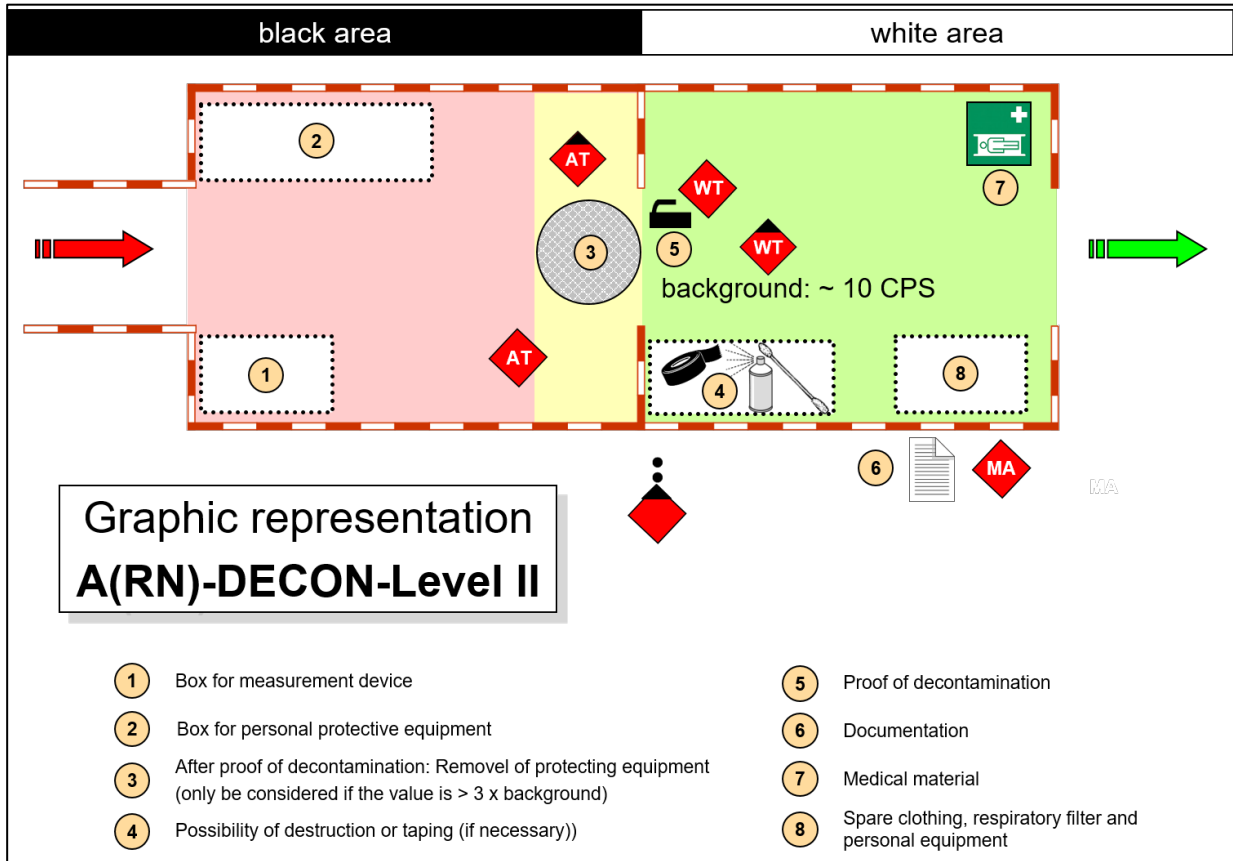


Figure 1: Level II A decon station (Decon P) [Source: Institut der Feuerwehr NRW]

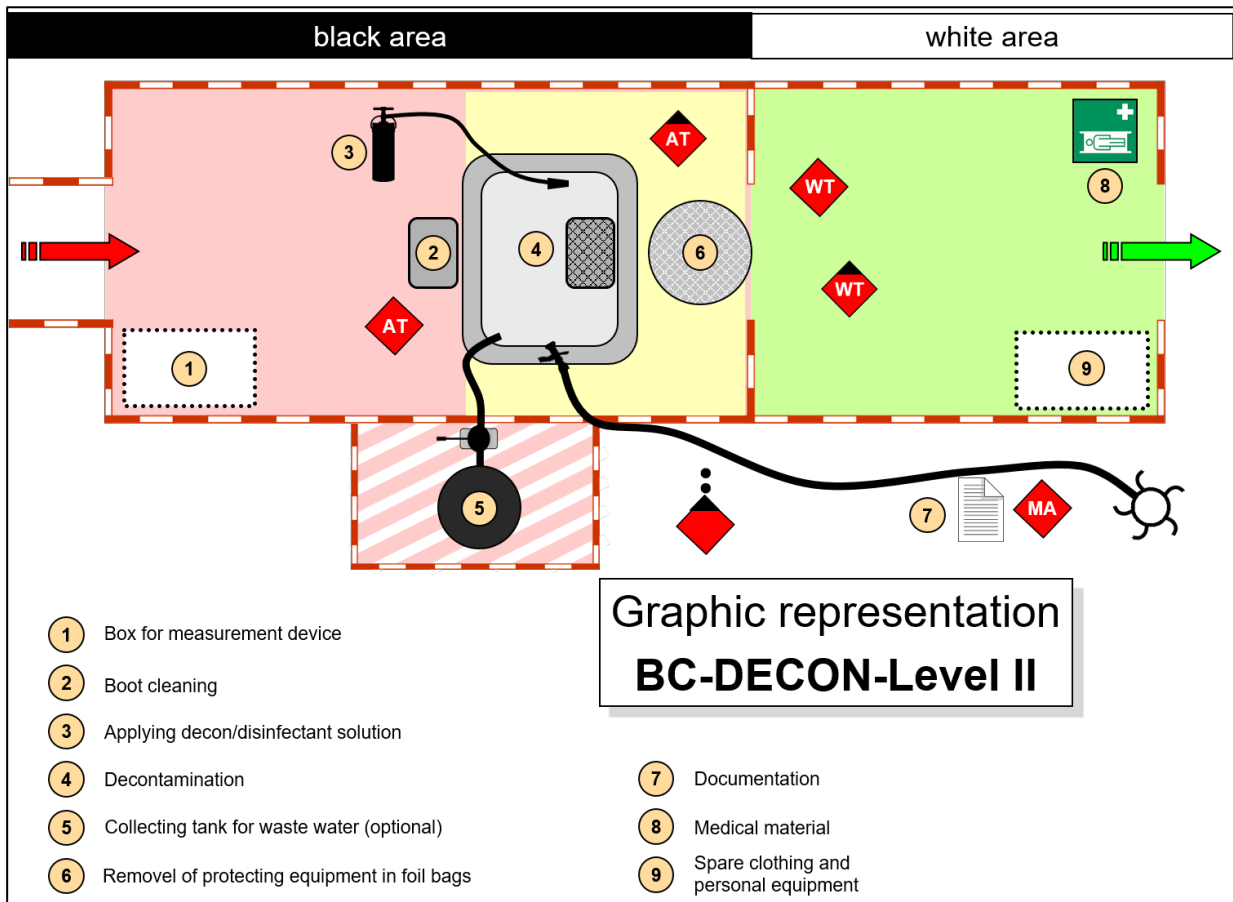


Figure 2: BC decontamination station level II (Decon P) [Source: Institut der Feuerwehr NRW]

### 2.3. Decontamination level III: Extended decontamination

Level III decontamination measures are all cases that exceed the scope of level II, e.g. because a large number of people need to be decontaminated, the weather conditions require special precautions (tents, etc.) or the contamination requires special decontamination procedures (e.g. special decontamination equipment). A separate *decon* section must always be set up for level III decon measures.

Compared to decon level II, work steps must be carried out several times in parallel (e.g. undressing, assistance with showering) and additional work must be carried out (e.g. preparation of decon agents, registration, supply and removal of consumables or contaminated residues). The number of personnel required depends on the type and scope of these additional measures, but is significantly higher than for level II. Decon level III can also be carried out in stationary facilities (e.g. shower areas of sports facilities).

For injured persons (Decon V), the principles of immediate decon also apply here!

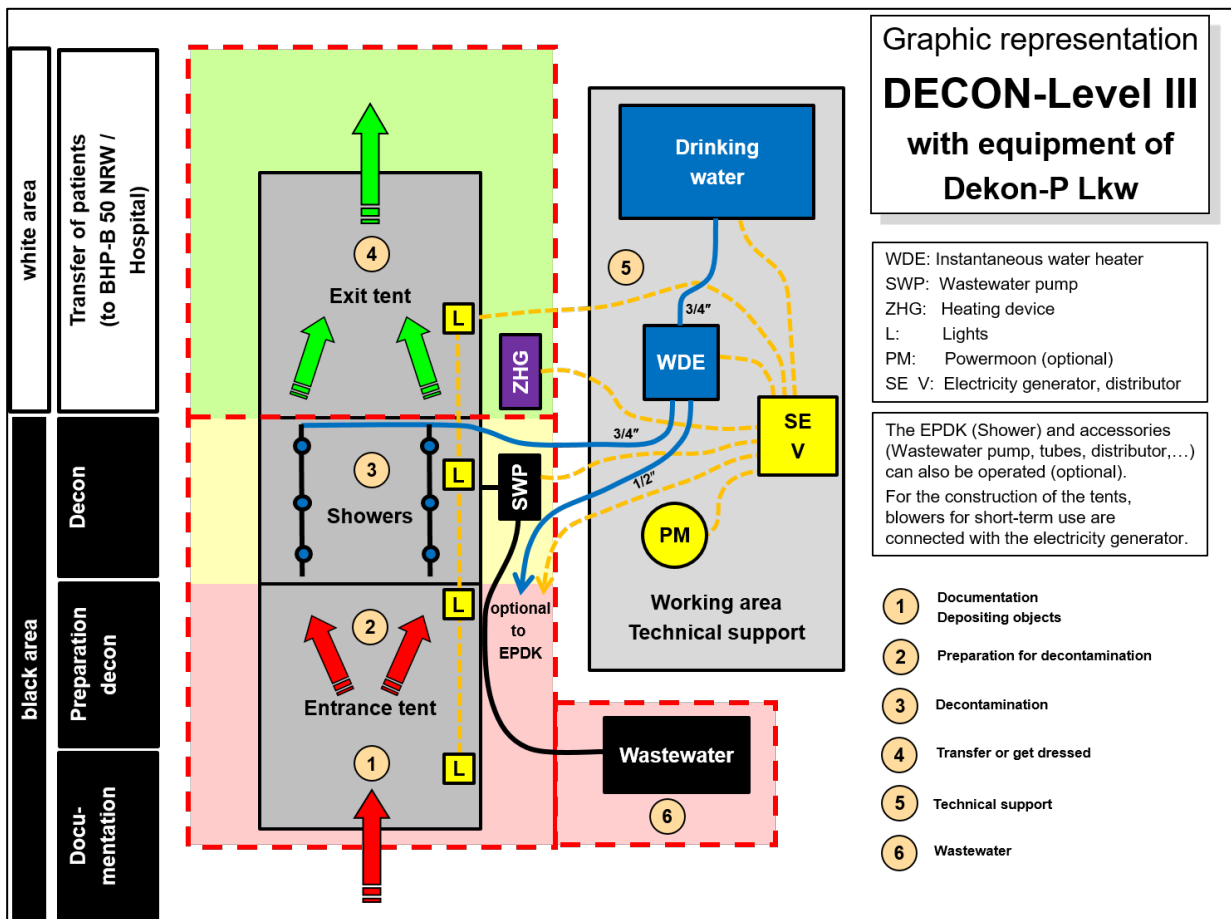


Figure 3: BC-Dekon Level III (GW Dekon P Bund) [Source: Frank Wenking, Institut der Feuerwehr NRW]

#### Note on the force deployments of the decon levels in accordance with FwDV 500:

If special equipment or operational decontamination facilities are available, decontamination can also be carried out by fewer emergency personnel if necessary.

### 3. Equipment notes

#### 3.1. Equipment of the Federal GW Decon P

The federal government is increasing the resources of local authorities and the federal states for NBC operations, for example by providing equipment for Decon P and Decon V.

The equipment is loaded onto the GW Dekon P. It enables personnel or injured persons to be given a warm shower in a tent. Under optimum conditions, the maximum throughput of the GW Dekon P is 50 people per hour who can walk.

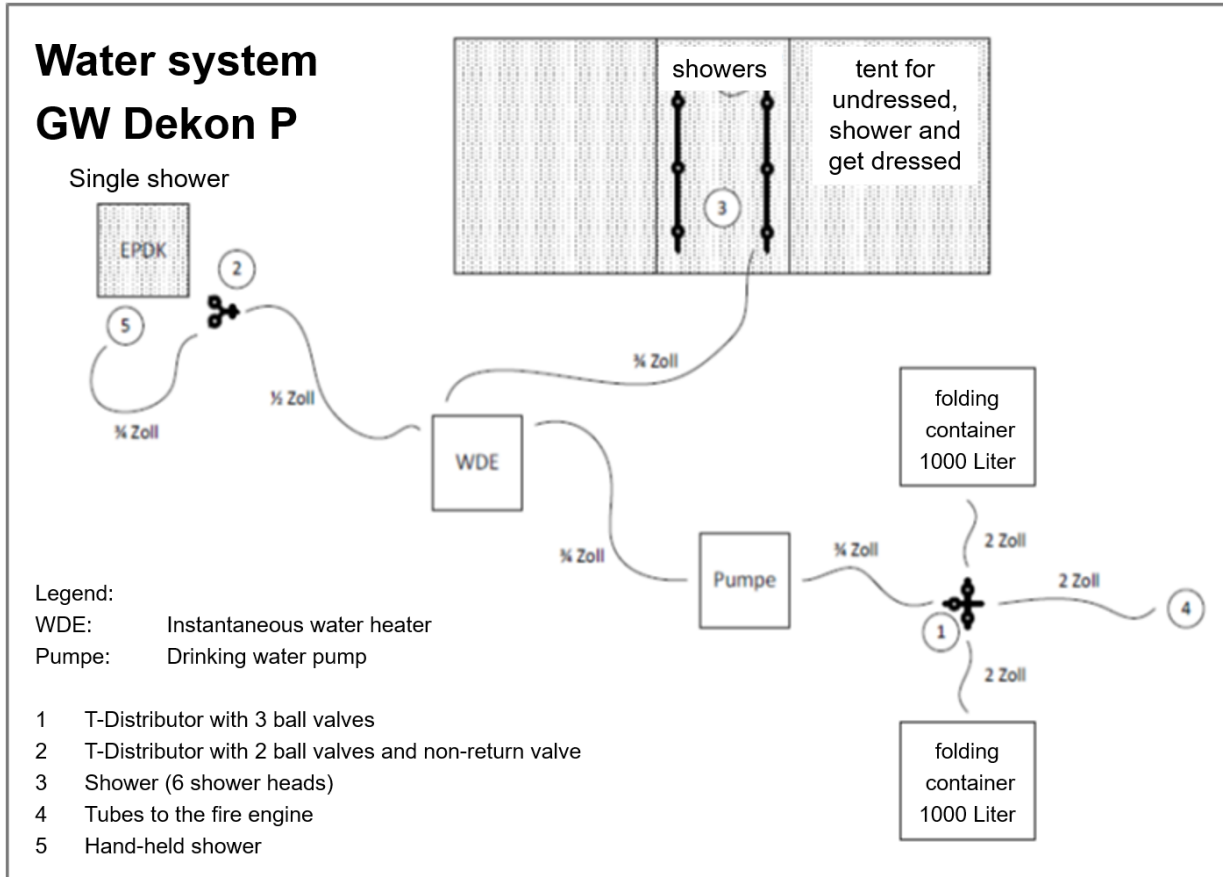


Figure 4: Schematic structure of the water system of the GW Dekon P (Federal Government) [Source: BBK].



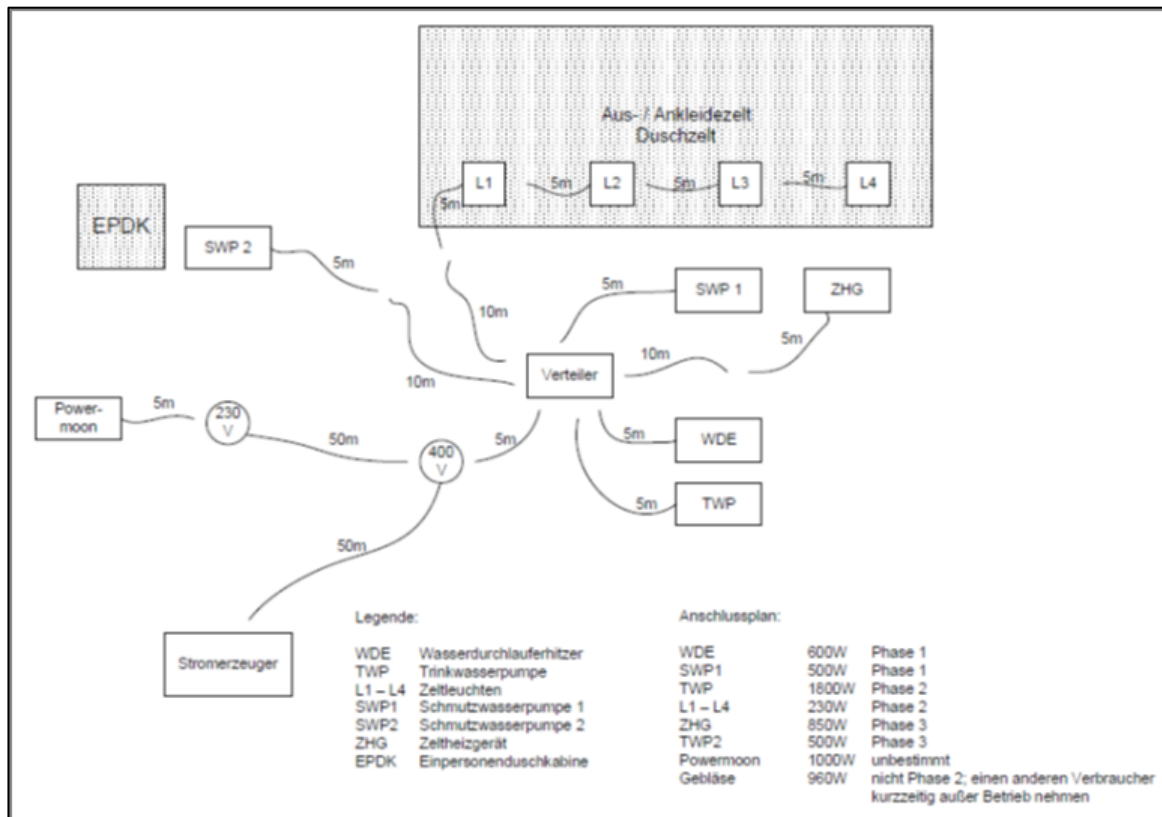


Figure 5: Schematic diagram of the electrical system of the GW Dekon P (Federal Government) [Source: BBK]

### 3.2. Recommended expansion of the federal equipment for decon levels II and III

#### 3.2.1. Decon agents

- Disinfectants and decontamination agents in accordance with vfdb guideline 10-04,
- Pressurised sprayer for applying decon/disinfectant solution,
- Dosing and mixing equipment.

#### 3.2.2. Material for decontaminating injured persons (Decon V)

- Stretcher block,
- Stretcher with net covering,
- Clothes scissors,
- Stock up on non-woven compresses, paper towels and burn dressing wipes,
- Waterproof wound cover (e.g. cling film),
- Eye wash bottle,
- Eye protection (swimming goggles),
- Spare clothing for 10-20 people and
- First-aid kit or emergency kit.
- etc.

#### 3.2.3. Other tools

- Foil bags,
- Plastic tarpaulins,
- Fire extinguisher,
- Lighting device and
- Barrier material.

4. Examples of North Rhine-Westphalia structures for decon levels II and III

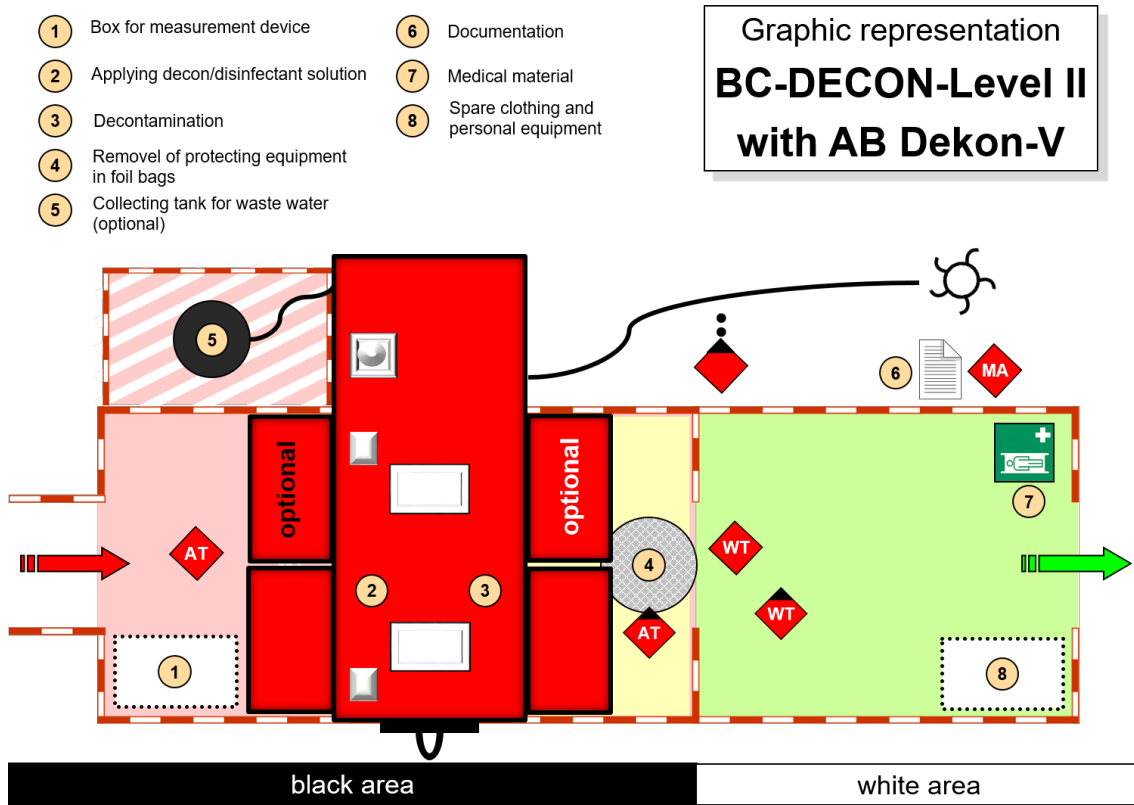


Figure 6: BC decontamination station level II with AB V decontamination [Source: Institut der Feuerwehr NRW]

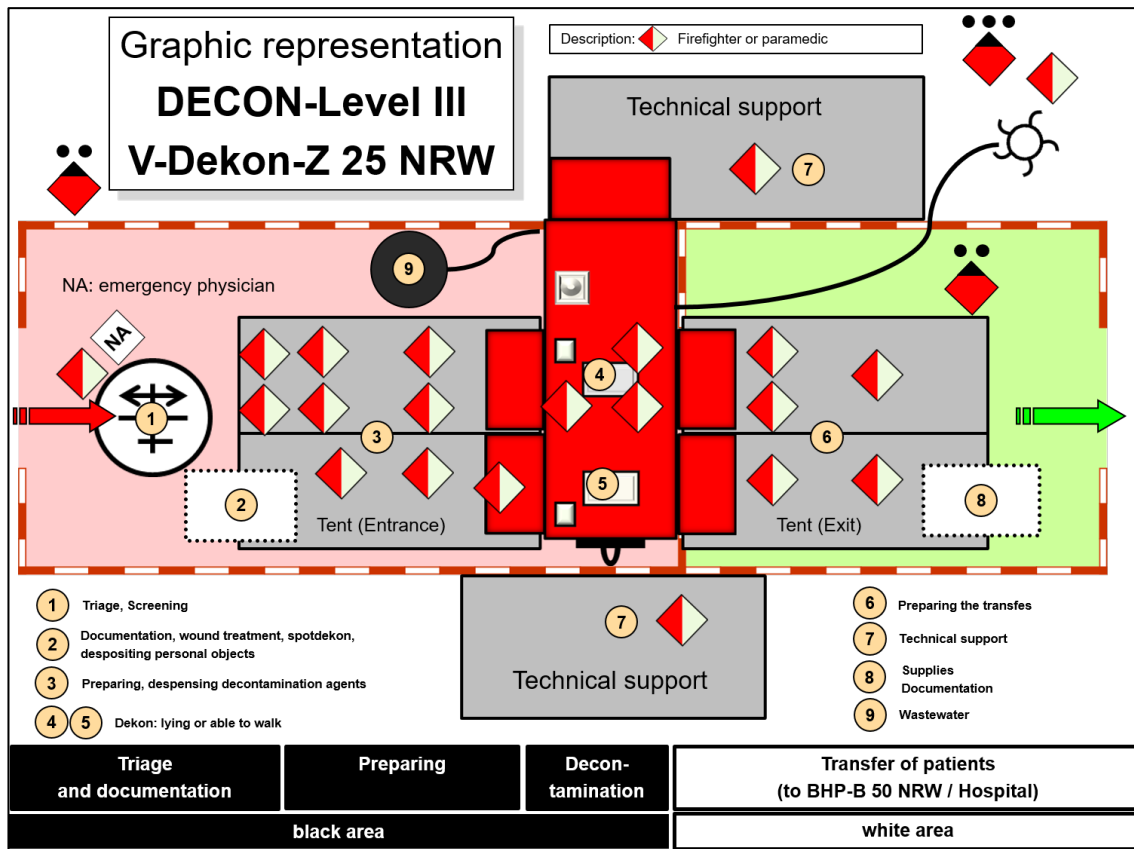


Figure 7: Decon Level III V-Dekon-Z-25 NRW [Source: Institut der Feuerwehr NRW]

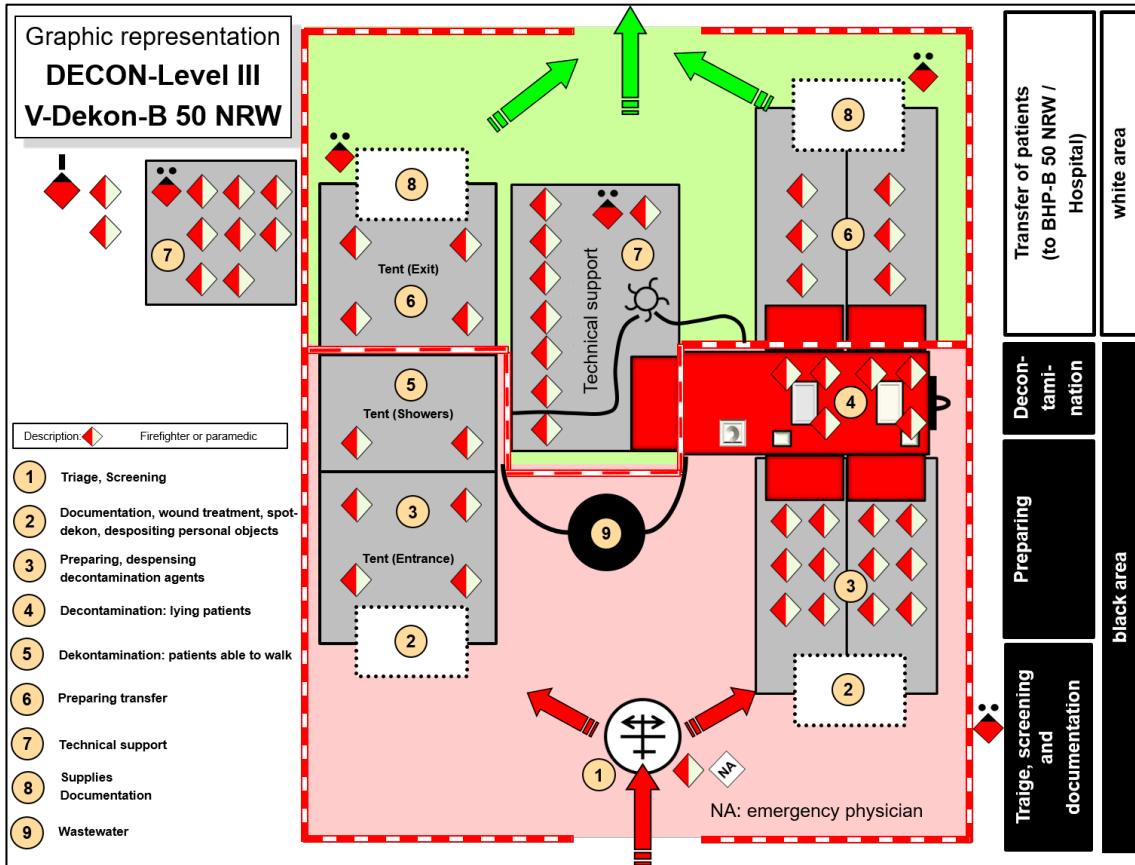


Figure 8: Decon level III V-Dekon-B 50 NRW [Source: Institut der Feuerwehr NRW]

Appendix 1: Sample personal accompanying card/proof of decontamination

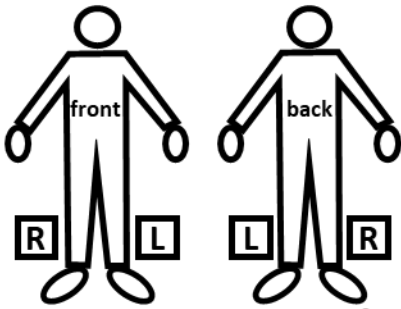
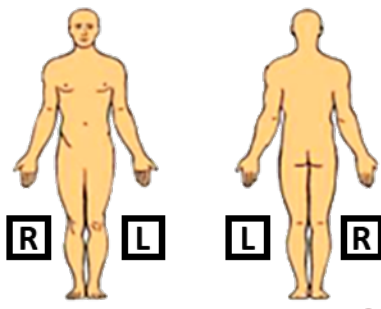
<b>Personal accompanying card/Proof of decontamination</b>					
<p><b>1. Personal data</b></p> <p>Sex:                    <input type="checkbox"/> female    <input type="checkbox"/> male    <input type="checkbox"/> divers</p> <p>Name: _____</p> <p>First name: _____</p> <p>Date of birth: _____</p> <p>Residence: _____</p> <p>Street address: _____</p> <p>Whereabout at the time of the incident: _____</p> <p>Duration of the stay at the time of the incident: _____</p> <div style="float: right; border: 1px solid black; border-radius: 50%; width: 150px; height: 150px; display: flex; align-items: center; justify-content: center; margin-left: 20px;"> <div style="text-align: center;"> <p>Sticker or number</p> <div style="border: 1px solid black; width: 80%; height: 40%; margin: 0 auto;"></div> </div> </div>					
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; border: none;"> <p><b>2. Contamination with?</b></p> <p>Substance name: _____</p> <p>UN- or CAS-number: _____</p> <p>Exposure time: _____</p> <p>Other informations (on the reverse if necessary): _____</p> <p>Contamination on clothes/protective clothes: _____</p> </td> <td style="width: 50%; vertical-align: top; border: none;"> <p><b>3. Incorporation?</b></p> <p><input type="checkbox"/> yes    <input type="checkbox"/> no    <input type="checkbox"/> suspicion</p> <p>Contamination on the surface of the skin: _____</p> </td> </tr> </table> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p style="color: red; font-weight: bold;">Please mark the location!</p> </div> <div style="text-align: center;">  <p style="color: red; font-weight: bold;">Please mark the location!</p> </div> </div>				<p><b>2. Contamination with?</b></p> <p>Substance name: _____</p> <p>UN- or CAS-number: _____</p> <p>Exposure time: _____</p> <p>Other informations (on the reverse if necessary): _____</p> <p>Contamination on clothes/protective clothes: _____</p>	<p><b>3. Incorporation?</b></p> <p><input type="checkbox"/> yes    <input type="checkbox"/> no    <input type="checkbox"/> suspicion</p> <p>Contamination on the surface of the skin: _____</p>
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<p><b>4. Decontamination measures?</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> undressed  <input type="checkbox"/> obvious contamination dabbed  <input type="checkbox"/> washed off with water                 </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> soap applied  <input type="checkbox"/> other _____  <input type="checkbox"/> sponge/cleaning cloth                 </td> </tr> </table>				<input type="checkbox"/> undressed <input type="checkbox"/> obvious contamination dabbed <input type="checkbox"/> washed off with water	<input type="checkbox"/> soap applied <input type="checkbox"/> other _____ <input type="checkbox"/> sponge/cleaning cloth
<input type="checkbox"/> undressed <input type="checkbox"/> obvious contamination dabbed <input type="checkbox"/> washed off with water	<input type="checkbox"/> soap applied <input type="checkbox"/> other _____ <input type="checkbox"/> sponge/cleaning cloth				
<p><b>5. Originator?</b></p> <p>_____</p>					
<p>_____</p> <p><b>Fire department/Office</b></p>	<p>_____</p> <p><b>Name/Secretary</b></p>	<p>_____</p> <p><b>Date</b></p>	<p>_____</p> <p><b>Time</b></p>		

Figure 9: Personal escort card (sample) [Source: FwDV 500]

## Appendix 2: Contamination map

Any contaminated material (e.g. equipment, PPE) must be decontaminated at the place of use, tightly packed and labelled on the outside, e.g. with the printed card. The transport packaging must also be labelled. The material should be prepared in a box.

<b>Contamination attachment card</b>	
Date: _____	Time: _____:_____
Fire department: _____	
<b>Cause:</b>	
Product was exposed (please mark):	
<input type="checkbox"/> Fire	
<input type="checkbox"/> Hazardous material	
<input type="checkbox"/> Other material: _____	
<b>Content:</b>	
The content of this package is contaminated with	
<input type="checkbox"/> probably <input type="checkbox"/> sure	
<input type="checkbox"/> nuclear/radioactive (RN) <input type="checkbox"/> biological (B) <input type="checkbox"/> chemical (C)	
substances.	
<input type="checkbox"/> Substance name: _____                      UN-Nr.: _____	
<input type="checkbox"/> Soot (particles)	
<input type="checkbox"/> Other material: _____	
<b>Decontamination (rough):</b>	
The content of this package is decontaminated (rough)with	
<input type="checkbox"/> Water <input type="checkbox"/> Soap <input type="checkbox"/> Solvent (_____),	
<input type="checkbox"/> Disinfecting solution (_____) Exposure time _____ min.	
<input type="checkbox"/> Other material: _____	
The exposure time of the hazardous material	
until decontamination: _____ min.	
<b>Package is:</b>	
<input type="checkbox"/> gas-tight <input type="checkbox"/> watertight <input type="checkbox"/> shockproof <input type="checkbox"/> without special feature	
<input type="checkbox"/> Open carefully, wear protective clothes!	
<b>Handling:</b>	
<input type="checkbox"/> Do not drop. <input type="checkbox"/> Handle carefully	
<input type="checkbox"/> Watch out for: „This side up!“	
Contact person fire department: _____ (Name)	
_____ (Signature)	
Tel.-Nr. for possible queries: _____	
E-Mail for possible queries: _____	

Figure 10: Contamination attachment card (sample) [Source: Düsseldorf Fire Department]

Note: Dispose of in consultation with the responsible authorities!

**Appendix 3: Decon measures for emergency personnel depending on the decon level and the contamination (decon matrix)**

<b>Type of operation</b>	<b>Decon-Level I Immediate decontamination</b>	<b>Decon-Level II Standard decontamination</b>	<b>Decon-Level III Extended decontamination</b>
<b>RN- Operation</b>	Clean contaminated areas of skin as quickly as possible. If skin contamination or incorporation is suspected, the person must be presented to an appropriate doctor.	After checking for contamination with the contamination detection device, the protective clothing is removed. Anything with more than three times the zero rate is considered contaminated and must be suitably packaged and labeled.	Decontamination such as level II and use of certain special equipment such as showers, tents or changing facilities.
<b>B- Operation</b>	Disinfect contaminated areas of skin as quickly as possible. If skin contamination or incorporation is suspected, the person must be presented to an appropriate doctor.	Disinfect the surface of the protective clothing with a suitable disinfectant. After the exposure time, the protective clothing is rinsed and removed. The cleaning fluid must be collected.	Disinfection such as level II and use of certain special equipment such as showers, tents or changing facilities. Then remove the protective clothing and underwear if necessary. The cleaning fluid must be collected.
<b>C- Operation</b>	Clean contaminated areas of skin as quickly as possible. If skin contamination or incorporation is suspected, the person must be presented to an appropriate doctor.	Decontamination with water and aids. The protective clothing is then removed. The cleaning fluid must be collected.	Decontamination with warm water and cleaning additives if necessary, and use of necessary special equipment such as showers, tents or changing facilities. Then remove the protective clothing, including underwear if necessary. The cleaning fluid must be collected.

[Source: FwDV 500]

In the event of multiple contamination (RN+B+C), the following sequence applies to the protective clothing: B -> C -> RN as listed in RL 10-04.