TRANSMOUNTAIN

Decontamination Plan

DECONTAMINATION PLAN

Table of Contents

Plan Maintenance

Responsibility

The accountability for the Decontamination Plan development and maintenance is a combined effort by the Trans Mountain Manager, Emergency Management. This accountability is such:

- The document is owned by the Emergency Management Program as a supplemental plan to the Emergency Response Plan (ERP).
- The administrative management for the Decontamination Plan will be administered by the Emergency Management Program.

Plan Revisions

All requests for change must be made through the Manager, Emergency Management using the Revision Request Form located in this section of the manual.

Revisions after Release or Exercise

In the event that Trans Mountain experiences a release (worst case or otherwise), or conducts an exercise or training session, the effectiveness of the ERP and its supplemental plans will be evaluated and updated as necessary.

Changes in Operating Conditions

If a new or different operating condition, or information, would substantially affect the implementation of the ERP and its supplemental plans, Trans Mountain will modify these to address such a change.

Revision Request Form

Requested by:	Date:
Dept/ Agency:	Phone No.:
Revision Type: ___ Addition	___ Deletion ___ Correction
Manual Section:	Page:
Revision (attach separate sheet if necessary):	
Signature of Requestor:	
Send to: Manager, Emergency Management Trans Mountain 2700-300 - 5th Avenue S.W. Calgary, AB T2P 5J2 Canada Fax: (403) 514-6401	

To be completed by Manager, Emergency Management	
Date Received:	Comments:
Date Reviewed:	
Issued as Revision: Y/ N	
If No, reason for Rejection:	
Signature Manager, Emergency Management	

Control Sheet

Revision Number	Date of Revision	Change(s)	Approval
1	March 2017	New Decontamination Plan Issued	K. Malinoski
2	April 2018	Annual Review of Plan Completed	K. Malinoski
3	October 2018	Re-Branded to Trans Mountain Corporation	K. Malinoski
4	October 2018	QA/QC of Rebrand	C. MacDonald
5	September 2020	Minor wording and terminology changes throughout the plan, including revisions to Section 1.4 Implementation of the Decontamination Plan and Section 5.3 Equipment Decontamination Procedures. Addition of Section 7.0 Winter Decontamination Considerations	K. McLernon
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

1.0 INTRODUCTION

1.1 Purpose

The purpose of the Decontamination Plan is to act as a guide for responders during emergency response operations in order to protect responder health and safety and prevent the spread of contamination into the environment from potentially harmful substances.

1.2 Scope

The Decontamination Plan applies to all Trans Mountain employees and contractors who may respond to environmental emergencies along the Trans Mountain Pipeline and its associated facilities. The scope of this plan is intended to cover the decontamination process at the site level, as emergency responders and equipment move from identified Hot Zones to Cold or “Safe” Zones. In the event that third party contractors supporting the incident provide their own decontamination plan for personnel and equipment, or if third party resources exceed the scope of Trans Mountain Decontamination Plan, then in such instances third party contractors will follow their own designated plan with the approval of the Operations Section Chief.

The Decontamination Plan is considered a subset of Trans Mountain’s ERP(s) and has been developed to align with the Incident Command System (ICS).

This Plan should be considered as an operational tool used to assist responders during emergency response operations. The Plan does not supersede current Trans Mountain Health & Safety Policies and should be reviewed and approved by the Safety Watch and On-Scene Supervisor prior to implementation.

1.3 Objectives

The objectives of the Decontamination Plan are to:

- Define a step by step process for response personnel to follow when moving from hot to Cold Zones.
- Identify and establish appropriate decontamination layouts for personnel and equipment.
- Ensure responders are aware of the decontamination process and follow the appropriate steps as directed by the Decontamination Supervisor.
- Prevent the surrounding environment from being further contaminated by hydrocarbon due to responders and equipment moving in and out of the work area (“Hot Zone”).
- Ensure that hydrocarbon contaminated Personal Protective Equipment (PPE) and hydrocarbon contaminated materials, liquids, etc. used in the decontamination process are properly disposed of.
- Ensure that the decontamination of personnel and equipment is fully documented.

1.4 Implementation of the Decontamination Plan

Activation of the Trans Mountain ERP will occur when an emergency is declared. Once an emergency has been declared, and the need for decontamination has been identified, the Decontamination Plan will be initiated, and the decontamination trailer dispatched.

The Decontamination Plan will be used in conjunction with other appropriate plans for the response phase of the incident. This will be used during the transition from a response phase to the remediation phase as determined by Unified Command.

Implementation of the Decontamination Plan is a function of the Operations Section.

2.0 ROLES & RESPONSIBILITIES

2.1 Decontamination Group Supervisor

Under the Recovery and Protection Branch Director, the Decontamination Group Supervisor is responsible for decontamination of personnel and response equipment according to the Decontamination Plan. The Decontamination Group Supervisor's responsibilities are outlined in the Trans Mountain Incident Command System Guide.

2.2 Decontamination Crew

Under the Decontamination Group Supervisor, the Decontamination Crew is responsible for the physical decontamination of personnel and response equipment according to the Decontamination Plan. Responsibilities are as follows:

- Assist Decontamination Group Supervisor in development of the incident specific decontamination plan.
- Set up Decontamination Zones with appropriate equipment found on the Trans Mountain Decontamination Trailer.
- Establish a check-in system at the Decontamination Zone in order to monitor responders entering and leaving the Hot Zone.
- Ensure the decontamination process is understood and followed by all responders leaving the Hot Zone.
- Ensure contaminated clothing and equipment is effectively cleaned and disposed of prior to leaving the Warm Zone.
- Maintain Activity/Unit Log (ICS 214).

3.0 LOCATION AND LAYOUT CONSIDERATIONS

The ideal location for a Decontamination Zone (Warm Zone) would be on flat ground with a slight grade downhill toward the Hot Zone, uphill and upwind from the Hot Zone, and in close proximity to vital resources i.e., water, electricity, etc. Additionally:

- Ensure Decontamination Zone is accessible to an emergency medical unit.
- Establish Decontamination Zone such that it is accessible to response vehicles, equipment, watercraft, and/or vessels.
- Ensure Decontamination Zone is in close proximity to the disposal staging area.
- Place a windsock on higher ground and upwind of the Warm Zone, such that it is visible from the Warm Zone.
    - **Note:** Safety Watch will determine the Warm/Hot Zone boundary prior to the location of the Warm Zone location being identified.
- Identify Warm Zone/Hot Zone boundary with red barrier tape and delineator posts.
- Identify Warm Zone with yellow barrier tape and delineator posts.
- Place fire extinguishers just outside of the secondary containment area in the warm zone.
- If also establishing a Small Equipment Decontamination Zone, position the Personnel Decontamination Zone just after the Small Equipment Decontamination Zone.
- Dispose of contaminated materials after closure of the Decontamination Area as per the incident Waste Management Plan.
- Refer to Section 8.0 Sample Layouts for sample personnel, small equipment/personnel, and watercraft Decontamination Zone layouts.

3.1 Personal Protective Equipment Considerations

The need for respiratory protection will be determined by the Safety Officer after a review of the Safety Data Sheet (SDS) and data retrieved from the initial site assessment. If toxic vapour levels are determined to exceed safe working limits, it may be possible for responders to work while wearing half-face respirators fitted with organic cartridges, or SCBA. In this case, ongoing vapour monitoring is essential to ensure that vapour levels do not exceed safe working limits. For exposure limits see the Trans Mountain Health and Safety Standards Manual Section 502 “Action Levels”. To minimize the accidental absorption of toxins through skin/eye contact, the following PPE is recommended:

- Approved fire-resistant coveralls
- Hard hats
- Gloves
- Splash goggles
- Rubber steel-toed boots

Also:

- PPE must be worn properly in order to fully protect responders.
- Damaged or heavily-oiled PPE should be replaced as soon as possible
  - **Note:** If a responder inhales, ingests, or comes in direct contact with a hazardous substance, the “Hazardous Substance Exposure Report” must be completed.

4.0 PERSONNEL DECONTAMINATION

Personnel decontamination consists of cleaning PPE in a series of decontamination pools and then removing the PPE and placing into appropriate drums for reuse or disposal.

4.1 General Guidelines

The following are general guidelines for personnel decontamination:

- Personnel Decontamination Zone will be established onsite during all response activities.
- All personnel will be briefed on the Decontamination Procedure prior to entering the Hot Zone.
- Decontamination Unit personnel will be available for assistance.
- Gas detection must be in place in the Decontamination Zone.
- When decontaminating, keep the Decontamination Zone as clean and orderly as possible.
- Replacement and/or repair of materials will be based on field observation of wear and amount of contamination.

4.2 Zone Setup and Layout

The Decontamination Corridor will be underlain with sorbent industrial matting and have a large secondary containment berm on top of matting. Primary containment berms i.e., wash pools will be positioned within the secondary Containment Berm. A sample Decontamination Zone layout for personnel is included in Section 8.1.

To establish the Decontamination Zone:

1. Identify the point of entry from the Hot Zone into the Warm Zone and also from the Warm Zone leading into the Cold Zone.
2. Lay out the Warm Zone boundary using Delineator posts.

3. Using traffic cones, mark out the entry point into the Warm Zone from the Hot Zone and the exit point into the Cold Zone.
4. Line the Decontamination Corridor with sorbent industrial matting.
5. Position and assemble secondary containment berm on top of sorbent industrial matting.
   - **Note**: If secondary berm is not readily available, use a heavy gage poly impermeable membrane such as a vapour barrier. After laying out the barrier, place sorbent pads/rolls along and on the outer edge of the barrier to control liquids. Periodically check liner for wear and replace when required. Follow the Waste Management Plan for disposal of contaminated materials.
6. Place primary (wash) and secondary (rinse) pools within the containment berms positioned approximately 1 metre apart. Ensure sorbent pads are placed under and between the two pools to absorb liquid when walking between pools.
7. Position storage and waste drums, sorbent wipes, pressure washers, pails, brushes, and cleaning solution within the secondary containment berm.
8. Position and lay out sorbent rolls/pads along the Decontamination Corridor entrance and exit routes.
9. Complete the identification of the Warm Zone by connecting yellow barrier tape to delineator posts.
10. If a generator is being used in close proximity, ensure that the generator and associated cordage are protected from water spray and positioned well away from combustible materials and sources of hydrocarbon vapours.
11. If required, establish an area to change respirator cartridges. Contaminated cartridges should be placed in trash bags and will be labelled and kept segregated from other waste until proper disposal has been arranged.
12. Depending on weather conditions and time of year, shelter for personnel may be required (wind, heat, cold, rain, etc.).

4.3 Personnel Decontamination Procedure

The following procedure should be followed for personnel decontamination:

1. Exit the work area (Hot Zone) after removing gross contamination leaving it in contaminated area for later clean-up and disposal. Gross contamination refers to oiled dirt, sod, or other contaminated natural or man-made material adhering to PPE which may be easily removed (“knocked off”) with a brush or similar implement.
2. Enter the Decontamination Area by stepping onto sorbent material.
3. Check-in with the Decontamination Group Supervisor upon entering the Warm Zone.
4. Place contaminated PPE that can be re-used i.e., raingear, serviceable Tyvek suits, rubber gloves, rubber boots, into the drum marked as “Oiled PPE”.
5. Put on splash goggles. Splash goggles will remain on until the decontamination procedure has been completed.
6. Enter the primary wash tub and clean heavily contaminated areas first. Remove all visible contamination from clothing and boots via sorbent pads and/or wash brush. Brush strokes should always be downward to reduce the chance of splashing toward the faced area.
7. After primary decontamination has been completed, walk across the sorbent rolls/pads that are between the primary and secondary decontamination pools and enter the secondary decontamination pool.
8. In the secondary rinse area, use sorbents to wipe off any residual contamination.
9. Remove protective clothing down to the boots.
   - **Note**: If wearing an Immersion suit, remove as much contamination as possible and place the suit in a designated bag or bin for future decontamination. If immersion suit is lightly oiled, clean and place in reuse bin.

10. Step out of and away from boots and clothing.
11. Place disposable clothing in waste bin and boots in bags for reuse.
12. Remove splash goggles and deposit inner gloves in the provided drum when exiting the Decontamination Zone.
13. Check-out with the Decontamination Group Supervisor when leaving the Warm Zone.
14. All liquid generated from the decontamination operation will be transferred to storage tanks used for the containment of recovered oil and water.

5.0 EQUIPMENT DECONTAMINATION

5.1 General Guidelines

The following are general guidelines for equipment decontamination:

- An Equipment Decontamination Zone will be established onsite in the Warm Zone during a response.
- All personnel will be briefed on the Decontamination Procedure prior to entering the Hot Zone.
- Decontamination Zone will be surrounded with containment material.
- Decontamination Unit personnel will be available for assistance.
- Gas detection must be in place in the Decontamination Zone.
- When decontaminating, keep the Decontamination Zone as clean and orderly as possible.
- Replacement and/or repair of materials will be based on field observation of wear and amount of contamination.

5.2 Zone Setup and Layout

The Decontamination Corridor will be underlain with sorbent industrial matting and have a large secondary containment berm on top of the matting. Primary containment berms, i.e., wash pools, will be positioned within the secondary containment berm. A sample Decontamination Zone layout for personnel and small equipment is included in Section 8.2, and a sample layout for decontamination of watercraft and tow vehicle or other land based vehicles is included in Section 8.3.

To establish the Decontamination Zone:

1. Identify the Warm Zone point of entry from the Hot Zone and also from the Warm Zone leading into the Cold Zone.
2. Lay out the Warm Zone boundary using delineator posts.
3. Using traffic cones, mark out the entry point into the Warm Zone from the Hot Zone and the exit point from the Small Equipment Decontamination Area into the Personnel Decontamination Area.
4. Underlay the decontamination corridor with sorbent industrial matting.
5. Position and assemble secondary containment berm on top of sorbent industrial matting.
    - **Note**: if secondary berm is not readily available, use a heavy gage poly impermeable membrane such as vapour barrier. After laying out the barrier, place sorbent pads/rolls along and on the outer edge of the barrier to control liquids. Periodically check liner for wear and replace when required. Follow the Waste Management Plan for disposal of contaminated materials.
6. Establish an equipment drop location within the secondary containment berm near the Hot Zone to deposit contaminated small equipment. If required, this equipment can be brought back into the Hot Zone for re-use without decontaminating.
7. Establish the primary (wash) decontamination and secondary (rinse) pools approximately 1 metre apart. Ensure sorbent pads are placed under and between the pools to absorb liquid when moving items between pools.

8. Position storage and waste drums, sorbent wipes, pressure washers, pails, brushes, and cleaning solution within the secondary containment berm.
9. Position and lay out sorbent rolls/pads along Decontamination Corridor entrance and exit routes.
10. If a generator is being used in close proximity of the Decontamination Area, ensure that the generator and associated cordage are protected from water spray and positioned well away from combustible materials and sources of hydrocarbon vapours.
11. If required, establish an area to change respirator cartridges. Contaminated cartridges should be placed in trash bags and will be labelled and kept segregated from other waste until proper disposal has been arranged.
12. Depending on weather conditions and time of year, shelter for personnel may be required (wind, heat, cold, rain, etc.).

5.3 Equipment Decontamination Procedure

The following procedure should be followed for general equipment decontamination:

1. Check-in contaminated equipment with the Decontamination Group Supervisor when entering the Warm Zone.
2. If equipment cannot be moved without further contaminating the environment, decontaminate on-site using soap and water with a water rinse. Repeat this process until visible contamination is removed.
3. Drum expendable equipment (e.g., rope mops, brushes, tarps, etc.) as waste; do not decontaminate it.
4. Clean other equipment using wipes and soap-based degreaser.
5. Depending on oil viscosity, temperature, etc. brushes may be required to clean contaminated equipment. Different factors will influence which type of brush to use (type of oil, viscosity, temperature, and weather conditions).
6. Do a final wipe down of equipment. If needed, use sprayer after wiping down equipment.
7. Pass small equipment that has been decontaminated into the Cold Zone prior to personnel decontamination.
8. Notify Decontamination Group Supervisor once equipment has been cleaned. Decontaminated equipment will be inventoried by the Decontamination Group Supervisor and information will be forwarded to the Resource Unit Leader and the Staging Area Manager for final disposition of decontaminated equipment.
9. Contaminated PPE and waste will be cleaned and/or disposed of as per the Waste Management Plan.
10. All liquid generated from the decontamination operation will be transferred to storage tanks used for the containment of recovered oil and water.
11. Contaminated materials will be disposed of after closure of the Decontamination Zone as per the incident Waste Management Plan.

If steam cleaning of equipment is required:

1. Locate the decontamination steam cleaning area away from other personnel and equipment.
2. Position and layout the steam cleaning Decontamination Zone the same as for small equipment minus the wading pools and sorbents.
3. Move equipment into the Decontamination Area.
4. Steam cleaning personnel will follow their decontamination standard operating procedures and wear approved PPE.
5. Clean equipment.
6. Do a final wipe down of equipment.
7. Ensure liquid runoff is controlled and collected.

8. Use ICS form 211e “Check in List – Equipment” to document decontamination.

5.3.1 Watercraft Decontamination Procedure

The Watercraft Decontamination Zone should be located in close proximity to the watercraft launch/retrieval point. The watercraft decontamination procedure is as follows:

1. Load watercraft onto appropriate trailer and move into the Decontamination Zone.
2. Engage vehicle parking brake and chock trailer wheels.
3. Put on decontamination PPE.
4. Clean heavily contaminated areas with wipes. Scrub brushes and soap-based degreaser may have to be used depending on the oil viscosity, temperature, etc.
5. After removing most of the contamination, use soap-based degreaser and wipes to do final cleaning.
6. Ensure that watercraft trailer and tires are free of contamination.
7. Notify Decontamination Group Supervisor once equipment has been cleaned and ready to move into Cold Zone.
8. Exit into the Cold Zone.
9. Ensure liquids are controlled and collected.
10. Follow the Waste Management Plan for storage and transfer of contaminated materials/liquid.
11. Use ICS form 211e “Check in List – Equipment” to document decontamination.

6.0 MARINE VESSELS DECONTAMINATION

6.1 General Guidelines

Vessel decontamination involves the provision of a barge with a sufficient amount of double layer deflection boom to provide a containment area near the active offshore plume cleanup site.

Decontamination of vessels will be conducted by the responding marine response organization(s). Marine response organizations have their own procedure for decontaminating large and small marine vessels and will therefore use their own standard operating procedures when decontaminating vessels. In addition, marine responding organizations will:

- Notify the Trans Mountain Decontamination Group Supervisor once equipment has been cleaned and ready to be placed back into service.
- Use ICS form 211e “Check in List – Equipment” to document Vessel decontamination.

Here is an overview of the marine vessel decontamination procedure:

1. Open one end of boom.
2. Navigate the boat into the containment area and moor it.
3. Moor small skiffs with decontamination crews close the boom to secure Decontamination Area.
4. Either spray wash or wipe down the vessel to remove product.
5. Ensure a pumping system is available to retrieve sheen/product from Decontamination Area and transfer it to barge.
6. If initial vessel decontamination is completed and sheen is observed upon vessel egress from Decontamination Area, implement secondary decontamination.
7. Complete small vessel decontamination via use of dry-dock crane arrangement, as feasible. Small vessels should be lifted from the water and placed in boomed zones of dry-dock and washed down; the water from within boomed area should be collected.

8. Boom Zones where boats are lifted are monitored to prevent spread of sheen. All sheen/product from vessel decontamination will be collected via absorbent pad/boom or trash pump transfer to a frac or Baker tank or barge for quantification, reclamation, and proper disposal.

7.0 WINTER DECONTAMINATION CONSIDERATIONS

During winter conditions, it may be necessary to establish a heated enclosed decontamination corridor for decontaminating personnel and small equipment[1] and should be considered when developing the incident specific decontamination plan.

The primary concern during decontamination of personnel wearing reusable PPE under winter conditions is hypothermia. The is due to:

- Freezing of the decontamination liquids used during decontamination
- The loss of thermal layering when removing contaminated PPE

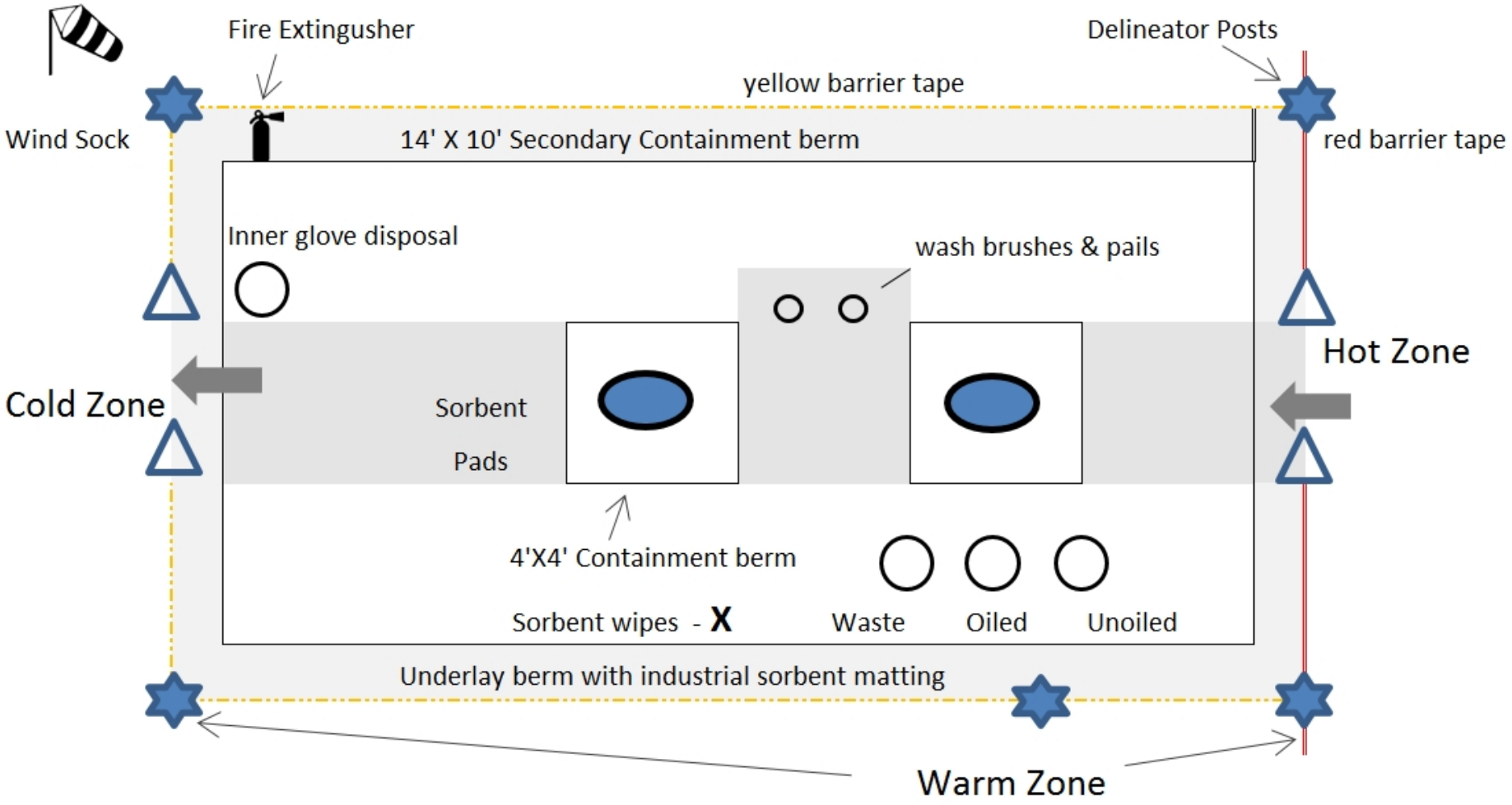
Utilizing a heated enclosed decontaminating corridor will minimize the risk of hypothermia. Safety considerations when establishing a heated decontamination corridor include, but are not limited to:

- **Ventilation**: Depending on the concentration and chemical properties of the contaminant, a ventilation system may be required to ensure safe air quality within the heated enclosed decontamination corridor.
- **Monitoring**: Ambient air quality monitoring within the enclosed decontamination corridor should be done to ensure that the air quality is within safety limits for personnel.
- **Fire hazards**: Consideration must be given to the type of heating units used to heat the enclosed decontamination corridor and the location of these units to ensure they do not pose a fire hazard.

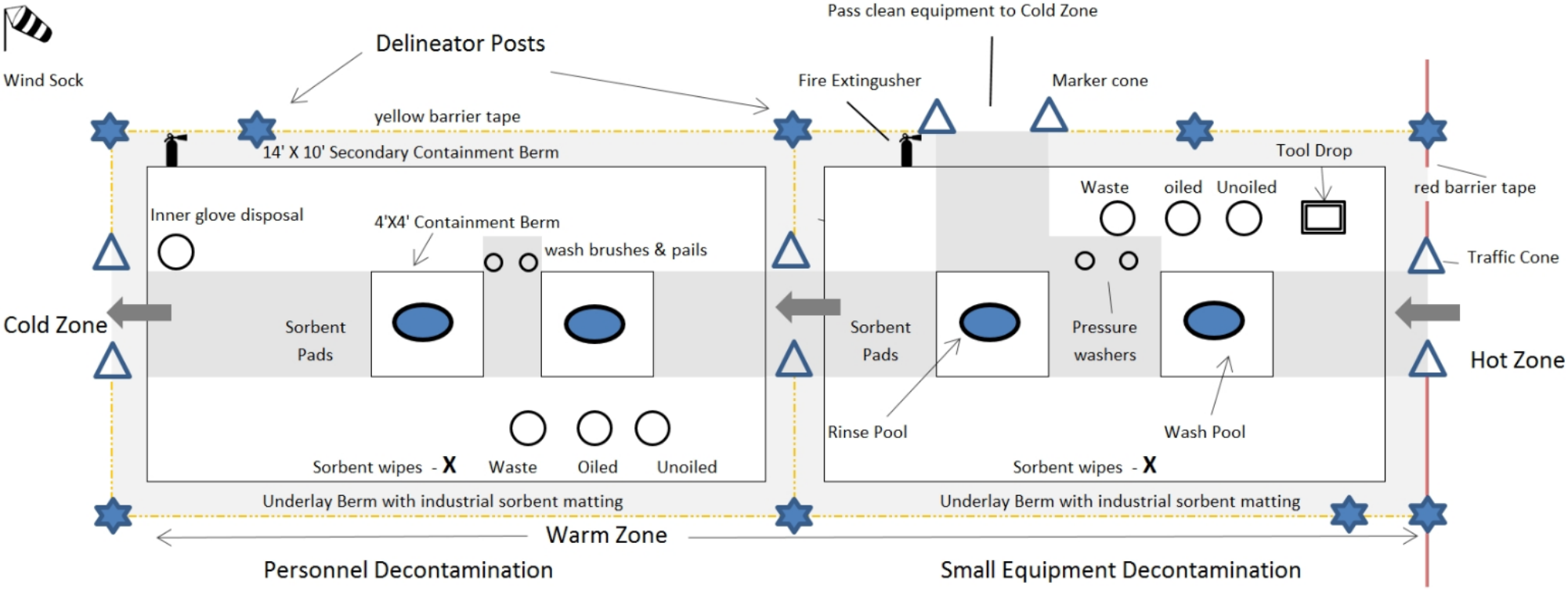
[1] Heavy equipment procedures already call for the use of heated pressure washing for decontamination, eliminating the need for any special considerations in winter conditions.

8.0 SAMPLE LAYOUTS

8.1 Personnel



8.2 Small Equipment & Personnel



8.3 Watercraft & Tow Vehicle