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| **YCFCA%20emblem** | **FLINT HILL FIRE DEPARTMENT****STANDARD OPERATING GUIDELINE** |

**Guideline Number:**  410.08

**Guideline Title:** Hazardous Materials

**Adopted:** 02/12/2024

**Rescinds:** New

**Approved By: (Chief)**

1. **PURPOSE:**

 The purpose of this guideline is to provide the basic response strategy for Flint Hill Fire Department (FHFD) to incidents involving hazardous materials, to meet the goal of protecting life, property, and the environment. These guidelines identify the approach that FHFD Operations Level personnel should take at incidents involving hazardous materials, regardless of the size, type, or complexity of the incident. This includes, but is not limited to; flammable vapor releases, such as natural gas, liquefied petroleum gas (LPG), acetylene, and any volatile vapors, liquid fuel spills such as gasoline, diesel fuel, and any other flammable or combustible liquid, acids, explosives, or any other substance that presents a threat to public safety or to the environment.

1. **DISCUSSION:**

 Every vehicle operated by FHFD has a DOT guidebook. This orange book is to be used by first-arriving companies to identify a product using name or number, identify emergency procedures to take, including evacuation zones for small and large spills, fire, etc., and offer initial responder protection criteria. These books are to be used only in the initial stages of a hazmat scene and more details will be needed from other sources (notably York County Emergency Management and Hazmat Teams) as the incident progresses.

1. **GUIDELINE:**

 The following guideline is recommended on all hazardous material incidents.

1. The appropriate apparatus should respond to the location quickly with due regard for the safety of others. Refer to (SOG 400.04 APPARATUS RESPONSE).
2. Approach cautiously from upwind, uphill, or upstream.
3. Stay clear of vapors, fumes, and spills.
4. Keep vehicles at a safe distance from the scene.
5. The following precautions should be taken by all personnel at the time of dispatch to possible hazardous materials:
6. All Personnel should don proper Personnel Protective Equipment (PPE). Minimum PPE for all firefighters working in the hazard zone, this includes reconnaissance, should be in full turnout gear. This includes self-contained breathing apparatus (SCBA).
7. Air monitoring equipment should be turned on to allow the sensors to warm up. Zero or fresh air calibration of the air monitor should not be done in the back of the apparatus. This could lead to false readings. Zero calibration will need to be done on scene, in fresh, clean air.
8. Note wind direction and wind speed.
9. Incident Command should be implemented following (SOG 402.01 INCIDENT COMMAND).
10. The incident commander (IC) should do an initial size up of the incident. A hazardous materials incident requires a more cautious and deliberate size-up than most fire situations. A few considerations during the size up should include, but not limited to:
11. Maintain a safe distance when conducting the size up.
12. Check the pre-incident preplan, if available.
13. Type of occupancy.
14. Gather information from bystanders, employees, or drivers.
15. Is there a fire, spill, or leak?
16. Who is at risk: people, property, or environment?
17. Is there a vapor cloud?
18. Quantity of hazardous material.
19. Container type and is it damaged.
20. After determining that a hazardous material is or may be involved, immediately notify Fire Com. Inform all incoming units of a safe direction of approach. Request the notification of York County Emergency Management and have them respond to the scene. The IC can also request additional units, some which may include:
21. York County Hazmat Team
22. Additional Fire units
23. Additional EMS units
24. Law Enforcement
25. Secure the scene.
26. When a hazardous material is involved, it is important to keep the public and emergency response personnel a safe distance from the incident to avoid exposure or contamination.
27. Without entering the immediate hazard area, you want to isolate the area and deny entry to unauthorized persons, including other responders. Some recommended methods of isolation include:
	* + - 1. Cones
				2. Caution tape
				3. Stage in coming units at intersections
				4. Law enforcement assistance
28. It may be necessary to evacuate everyone in the danger area to a safe location upwind / uphill of the incident area.
29. Control Zone and Site Safety
30. Establish an Isolation Zone using the Initial Isolation Distances obtained from the Emergency Response Guidebook for all spills. When establishing the initial Isolation Zone, local geography should be taken into consideration and used appropriately, i.e., highways, open spaces, railroad tracks, waterways. An example would be if a 300-foot Isolation Zone is required, and at 350 feet there is a railroad track, logically the Isolation Zone would be extended to the railroad track.
31. Hot, warm, and cold zones (cold zone also known as Safe Zones) shall be established, if can be done safely by the personnel on scene. The hot zone is defined as the area that is determined to be immediately dangerous to life and health (IDLH). If the zones cannot be established safely, they must be established when the York County Hazmat team arrives on scene.
32. FHFD personnel are only trained to the operations level and cannot enter a hot zone. The only exceptions are incidents involving gasoline, diesel fuel, natural gas, and propane.
33. Exclusion zones are a control zone to exclude all unauthorized personnel, responders, and equipment. Exclusion zones can be established with the hot zone and are considered hazardous to responders, (i.e., holes in floors, collapse, explosive devices).

**Tactical Considerations**

*Caution*: If you are not sure your PPE will provide adequate protection, *Do Not* commit personnel. Remain at a safe distance, create an isolation zone, deny entry, and call for appropriate resources. FHFD personnel should *never exceed* their level of training. Under no circumstances should FHFD assume responsibility for clean up or disposal of spilled or contained hazardous materials. The clean-up is the responsibility of the spiller.

1. Defensive Tactical Considerations:
	* 1. *Rescue:* May be attempted only if it can be accomplished without endangering personnel. All victims and rescuers will be considered contaminated and must be decontaminated. Rescues may be attempted under the following conditions:
			+ 1. PPE will provide adequate protection.
				2. Victim is deemed viable.
				3. The buddy system is utilized.
				4. Standby teams are in place.
				5. Emergency decontamination is established.
				6. Air monitoring is utilized.
				7. Use of pH strips placed on mask.
	1. *Confinement:* The type and amount of hazardous material and the specific situation will determine actions for control and confinement. Your goal may be to slow the spread of the material until mitigation can be performed by the Hazmat Team. Techniques for containment may include, but not be limited to:
		* + 1. Damming and / or diking
				2. Diverting
				3. Absorption (booms, pads, or pillows)
				4. Covering solids with tarps
	2. *Plugging transportation vehicle fuel tanks*: Although plugging fuel tanks is considered an offensive action, under certain conditions and with proper training, FHFD personnel trained to the Operations Level, may perform those functions. Plugging of gasoline or diesel fuel tanks may be allowed under the following conditions:
		* + 1. Those personnel engaging in this operation have the proper training and PPE.
				2. Ignition sources are removed.
				3. Defensive actions to reduce vapor production such as containment, absorption, damming, or diking are performed.
				4. A charged hose line is in place for emergency decontamination.
				5. A Dry Chemical extinguisher is manned during the plugging operation.
	3. *Extinguishment:* When a fire is involved during a hazardous materials incident, a decision will have to be made on attacking or allowing the fire to burn out. The type of product, life hazard, or need for special extinguishing agents will determine the course of action. The IC should consider the following:
		* + 1. Extinguishing agents applied to some products may become contaminated and should be considered hazardous. Run-off may cause a secondary clean-up and should be contained.
				2. Some poisons and pesticides breakdown more efficiently when they burn, resulting in a less toxic release. Cooling with water streams may increase contaminated waste and create an environmental hazard if not contained.
				3. Flammable gases that are burning should not be extinguished unless flow can be stopped. Unburned vapors can be hard to detect and may find an ignition source away from the release site, possibly causing an explosion.
				4. Some products are reactive to extinguishing agents increasing the magnitude of the fire.
				5. If flame is impinging on a pressurized container, water should be used to cool the container at the point of impingement. Be sure you have an adequate water supply before attempting this tactic.
2. Natural Gas Tactical Considerations:
	* 1. Leak Detection
			1. Blowing sound.
			2. Dirt blowing into the air.
			3. Bubbles from a pond or river.
			4. Fire coming from the ground.
			5. Browning vegetation with an inconsistent pattern.
			6. Odor of mercaptan or sulfur.
			7. Combustible Gas Indicator readings (LEL readings on meters).
		2. Chemical Characteristics:
			1. Natural gas is lighter than air.
			2. 4 – 15% flammable range.
			3. Easily ignited within flammable range.
			4. Will flash back to source when ignited.
			5. Can be trapped under asphalt or concrete causing lateral movement.
			6. Gas trapped in confined spaces can explode.
		3. Protective Actions:
			+ 1. Have Fire Com notify York County Natural Gas immediately.
				2. If the product is on fire: *Do Not Extinguish* and evacuate immediate area, control exposures, and air monitor surrounding area.
				3. In cases of rupture (no fire): Evacuate the immediate area, control ignition sources, and air monitor surrounding area.
				4. In cases of leak with no rupture: Evacuate the immediate area, air monitor surrounding exposures.
				5. FHFD should not stop any natural gas leak by clamping, pinching, or folding a line over, unless it involves life safety. If a gas leak needs to be secured and York County Natural Gas has an extended time of arrival, the IC should contact Fire Com and have Fort Mill Fire dispatched. Fort Mill Fire have approved tools for crimping gas lines.
3. Flammable Liquids Tactical Considerations:
	1. Leak Detection:
		* 1. All fuels have a strong distinctive odor when released.
			2. Colorful sheens will appear on water or flat surfaces.
			3. Pressurized leaks may blow dirt into the air.
			4. Fire may be coming from the ground.
	2. Chemical Characteristics:
		* 1. Gasoline is highly flammable and is easily ignited when released into the air.
			2. Diesel and jet fuel are combustible liquids and produce less vapor than gasoline.
			3. All products have vapors that are heavier than air and lighter than water.
			4. All products have increased volatility when released under pressure as aerosol.
			5. Diesel and jet fuel vapors are not easily detected with a combustible gas indicator (CGI) air monitor.
			6. All fuels have a strong distinctive odor when released.
			7. Warm weather can increase the volatility of these product
	3. Protective Actions:
		* 1. Evacuate exposures immediately down-hill and down wind. See Emergency

 Response Guidebook for evacuation distances.

* + 1. *Do not* extinguish fires at the source. Control impingement on exposures.
		2. Ignition sources should be limited if possible as fire will flash back to the source.
		3. Stay up hill and up wind from the spill as much as possible.
		4. Foam will NOT be effective if the spill is moving.
		5. Cover storm drains and sewers ahead of the spill.
		6. Divert spill to an open area if possible.
		7. Confined spaces will have displaced oxygen and flammable atmospheres.
		8. Booms, pads, and pillow absorbents will not be effective in large spills.
		9. Underflow dams can slow the product spread in creeks and streams.
		10. Do not attempt to dam a large gasoline flow.
		11. Avoid prolonged exposure to vapors.

4) Decontamination:

1. Decontamination is the process of making personnel, equipment and supplies safe by reducing the levels of toxic or otherwise harmful substances. The extent of decontamination required at an incident depends on the nature and physical state of the hazardous material, level of contamination, its health hazards, exposure, and any illness and/or injuries sustained to victims. The objective of decontamination is to reduce contamination to a level “As Low As Reasonably Achievable” (ALARA).
2. Establish Emergency or Mass Decontamination
	* + - 1. The IC will assign a Decontamination Group Supervisor to set up decontamination and oversee the decontamination operation.
				2. The Decontamination Area should be set up in the warm zone, uphill and up wind from the incident.
				3. For emergency decontamination, lay out a 1.75” charged hose line.
				4. For mass decontamination, place two fire apparatus about 20 feet apart. Position water spray so victims can wash themselves thoroughly with soap and water then move to a safe area.
				5. Have victims move to Decontamination Area independently if possible.
				6. Evaluate patients, dry brush powder contaminants, and check for burns.
				7. Flush patient head to toe for 5-15 minutes.
				8. Segregate symptomatic and non-symptomatic victims.
				9. Perform secondary evaluation of patient.
				10. Provide a blanket or Tyvek coverall and transport to hospital.
				11. Avoid aid unit contamination. Cover gurney with plastic and have aid crew in protective gloves.
				12. Notify hospital of contaminate involved in incident.
				13. Retain contaminated personal articles at the scene.

5) Emergency Medical Treatment and First Aid:

* 1. If emergency response personnel require first aid from exposure to hazardous materials, such treatment will follow standard medical protocols and information from Safety Data Sheets.
	2. If personnel receive treatment at a hospital, information on the nature of the hazardous material involved will be provided to hospital personnel.