HW Newsletter

Hazardous Materials Program
Waste Management and Prevention Division
Department of Environmental Conservation

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IN THIS ISSUE

Responding to Flooding

Homes, businesses, and infrastructure across the state were affected by the catastrophic flooding that occurred in July. While small towns and urban centers of central Vermont bore the brunt of the disaster, impacts were felt from the Northeast Kingdom to the southern part of the state.

The Hazardous Materials Program wants to acknowledge the important work of local government and emergency personnel, as well as the non-profit organizations and volunteers that assisted their communities. Following Governor Scott's executive order declaring a state of emergency, state government was also involved with response efforts. Some agencies remain tasked with work related to recovery. As for the Waste Management and Prevention Division (Division) of the Department of Environmental Conservation (DEC), personnel were busy in a few different capacities. The Division houses our Hazardous Materials Program, as well as the Spills and Solid Waste Programs, among others.

Flood-related debris in downtown Montpelier

The Spill Program received over 200 reports of hazardous material releases related to the flooding. Spills varied in magnitude and the material involved, but many were related to petroleum releases from above ground storage tanks (ASTs). When basements that have ASTs flood, or when outdoor ASTs are directly impacted by floodwater, ASTs can float, take on water, or fall over. This can result in broken fuel lines, displacement of oil, or releases to the environment. As part of their response, the Spill Program worked with EPA and contractors to coordinate pump outs of ASTs that were directly impacted by floodwater at no cost to tank owners. The majority of flood-related spills have been closed out at this point, but work is ongoing in some places.

The systems that normally facilitate the collection, hauling, and disposal of trash, household hazardous waste, and business-generated hazardous waste were not built to handle such a disaster, so an alternative approach had to be established. The Solid Waste and Hazardous Materials Programs—in conjunction with EPA, other governmental agencies, solid waste districts, waste management companies, and contractors—worked to

respond to the significant increase in needs for managing flood-related debris and hazardous materials. The collaborative effort resulted in several collection locations and events set up at the local level. State and federal partners also created a temporary collection location at the former police barracks in Middlesex, Vermont, and paid for the collection and disposal of the wastes collected.

Temporary collection site in Middlesex

From July 29 through August 12 in Middlesex, roughly 14,000 containers of flood-related hazardous materials were collected. A total of 219 cars were served in Middlesex, and 25 collection trips were also made around the state. Of note, 64 cubic-yard boxes of paint and 319 fluorescent bulbs were collected for proper disposal—along with containers of bad fuel, cleaning products, and many other dangerous wastes. Figure 1 shows a summary of the containers collected during the 13-day effort:

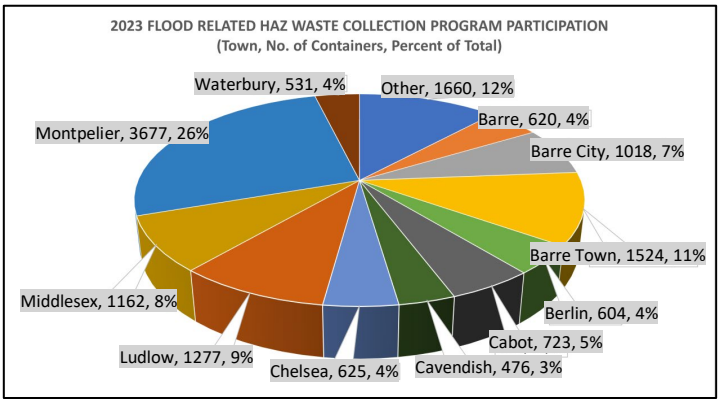

Figure 1: Town, No. of Containers, Percent of Total

With substantial impacts continuing to be felt across Vermont, we expect that guidance resources will be developed that are specific to flood preparedness, response, and recovery. For now, we want to share a few quick points from the Division:

- If you are in a situation where you need to handle a release of hazardous material to the environment, be it related to flooding or any other event, please follow the protocol outlined in the Hazardous Material Spill Response fact sheet. More information can be found on the Spill Program webpage.

- If you own or operate an AST, particularly if you are in a flood-prone area, please refer to our ASTs in Flood-Prone Areas brochure. Additional information and the current AST Rules are available on the Aboveground Storage Tanks webpage.

- If your business is impacted by a flood event, damaged recyclables, food waste, and other solid waste can be thrown away in the trash. However, all impacted hazardous materials need to be handled as hazardous waste. To protect public health and the environment, as well as the people that collect and haul waste, it is critical that businesses separate hazardous materials from trash and ensure their hazardous waste is transported to an appropriate destination.

It is expected that recovery efforts will take many more months in some areas. If your business needs assistance with questions related to hazardous waste, please do not hesitate to reach out to the Program using the contact information at the end of this newsletter. For more information on flood recovery resources from the Agency of Natural Resources, please visit the ANR Flood Recovery Resources webpage. ●

Final Word on Containers

With over 3,000 notified hazardous waste generators in Vermont, hazardous waste streams and management approaches vary greatly. The use of containers, however, is a common aspect of hazardous waste management for generators, transporters, and end facilities alike. For our final piece on a theme we have written about in the past few issues, we want to cover the container management requirements we have not already touched on.

As a reminder, you should refer to the Vermont Hazardous Waste Management Regulations (VHWMR) for specific requirements. Below is a list of broad requirements for managing containers of hazardous waste. Let's cover the final three requirements from the list to round out the discussion on this important topic.

Containers of Hazardous Waste Must Be:

- **Properly marked, depending on generator category (i.e., VSQG, SQG, or LQG) and container function (e.g., satellite accumulation, storage in a short-term storage area (STSA), etc.)**
- **Protected from freezing if contents are subject to freezing and expansion**
- **Located in a structure that sheds rain and snow, if located outdoors**
- **Closed except when adding or removing waste, or when temporary venting is necessary (e.g., to avoid pressure build-up)**
- **In good condition**
- **Chemically compatible with the waste stored**
- **Stored on an impervious surface**

GOOD CONDITION

While what constitutes "good condition" for containers is not explicitly defined in the VHWMR, it can be understood based on what the regulations state about what the opposite of good condition looks like in Section 7-311(f)(2):

"…If a container holding hazardous waste is not in good condition (e.g., damaged, bulging, leaking, or otherwise unsafe), or if it begins to leak, the owner or operator must immediately transfer the hazardous waste from this container to a container that is in good condition, or immediately manage the waste in some other way…"

Put simply, containers must be able to perform their intended purpose—to contain hazardous materials, preventing releases. A container that is not in good condition because it is damaged, or bulging, could fail to perform this essential function; a container that is leaking has already failed. If a handler identifies that a container is not in good condition, say, through inspecting their STSA or satellite accumulation area, they must take action. Failing to do so would constitute a violation of the VHWMR.

COMPATIBILITY

While the requirement for containers to be in good condition could be interpreted as one focused on the physical integrity of containers, the requirement for containers to be compatible with the waste they store is focused on the chemical aspects of both the container and the hazardous waste it holds.

Section 7-311(f)(3) requires handlers to use a container made of or lined with materials that will not react with and are otherwise compatible with the hazardous waste to be held, so that the ability of the container to contain the waste is not impaired.

The specific type of material to be used for hazardous waste containers is not prescribed in the regulations, because this would depend on the type of waste that the handler is storing. For instance, waste that is determined to be hazardous due at least in part to the corrosivity characteristic is often stored in plastic containers. Plastic is relatively corrosion-resistant when compared to other commonly used container materials, like stainless steel. This points to the importance of accurately identifying waste through the waste determinations process. You are only equipped to decide suitable container material when you understand the content and characteristics of your hazardous waste.

"If a handler identifies that a container is not in good condition, say, through inspecting their STSA or satellite accumulation area, they must take action."

STORING ON AN IMPERVIOUS SURFACE

Going beyond the specifics of the container itself, the regulations require handlers to be mindful of where they store containers. Specifically, containers of hazardous waste must be stored on an impervious surface, which the VHWMR define as a surface that is sufficiently impermeable to any waste material stored thereon to prevent that material from migrating into the surface or to the soil, groundwater, or surface water.

This requirement is in place as a safeguard in the event of a release of hazardous material from a container. Chances of containing and cleaning up the material associated with a spill are greatly increased when it has not entered environmental media like soil, groundwater, or surface water. Examples of impervious surfaces that are adequate for storing containers of hazardous waste include non-porous concrete and asphalt.

IN CLOSING

As mentioned in the previous issue, please refer to our fact sheet on Accumulation and Storage of Hazardous Waste for more information on container management. For guidance on other hazardous waste topics, please refer to our Resources for Hazardous Waste Handlers webpage. If you have any questions, please do not hesitate to reach out to the Hazardous Materials Program using the contact information at the end of this newsletter. ●

Lithium-Ion Batteries

Other than one notable exemption for the recycling of lead-acid batteries, business-generated batteries that meet hazardous waste criteria are regulated by the VHWMR as either hazardous waste or universal waste. With so much variety in the design and application of batteries, we are developing a fact sheet that covers regulatory and management considerations for generators. Please stand by for an update on that. In the meantime, with the increase in use and application of lithium-ion batteries, their association with fires, and related guidance that came out from EPA earlier this summer, we want to take a moment to discuss this type of battery specifically.

Lithium-ion batteries are a type of rechargeable (i.e., secondary cell) battery that uses the reversible reduction of lithium ions to store energy. The design

and chemistry of these batteries vary greatly depending on their application, but materials that are typically used include lithium, nickel, cobalt, manganese, graphite, iron, copper and aluminum foils, and an electrolyte. The electrolyte is typically a lithium salt in an organic solvent. Lithium-ion batteries have experienced a rapid increase in demand over recent years, and they have largely replaced both primary (e.g., alkaline) and other types of secondary cell (e.g., nickel cadmium, nickel-metal hydride) batteries in many applications. They are extremely energy dense, storing high amounts of energy in a battery that is smaller and lighter relative to other types. This makes them particularly useful for consumer electronics, electric vehicles and bikes, and stationary storage applications.

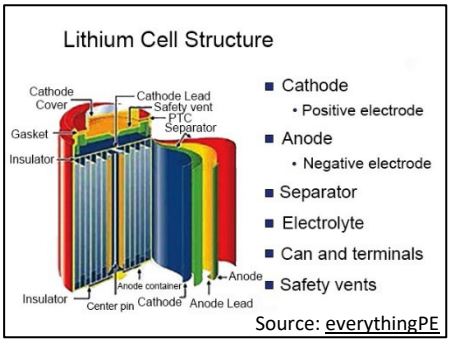

Figure 2: Li-Ion Cell Structure

Figure 2 illustrates a common design for a lithium-ion battery cell, with anode layer, cathode layer, and a separator.

ARE SPENT LITHIUM-ION BATTERIES HAZARDOUS WASTE?

As is the case with all other waste streams, generators are responsible for determining whether spent lithium-ion batteries are hazardous waste and managing them according to the applicable regulatory requirements. While it can be difficult to identify which lithium-ion batteries are hazardous waste at end of life due to the wide variety in design, chemistry, and application, most lithium-ion batteries on today's market are hazardous waste when they are disposed of, due in part to the ignitability and reactivity characteristics. If being managed as hazardous waste, the management requirements in Subchapters 1 through 7 of the VHWMR would apply. However, generators are encouraged to manage lithium-ion batteries as universal waste.

MANAGING LITHIUM-ION BATTERIES AS UNIVERSAL WASTE

Lithium-ion batteries that meet hazardous waste criteria may be managed by handlers of universal waste according to the requirements in the box below.

Managing Lithium-Ion Batteries as Universal Waste (UW)

- **Handlers must store any UW battery that shows evidence of leakage or damage in a container that is closed, structurally sound, compatible with the contents of the battery, and lacking evidence of leakage or damage.**

- **Handlers of UW may do the following, as long as the casing of each individual battery cell is not breached and remains intact and closed (cells may be opened to remove electrolyte but must be immediately closed after):**
  - Sorting batteries by type.
  - Mixing battery types in one container.
  - Discharging batteries to remove the electric charge.
  - Regenerating used batteries.
  - Disassembling batteries or battery packs into individual batteries or cells.
  - Removing batteries from consumer products.
  - Removing electrolyte from batteries.

- **Handlers of UW who remove electrolyte from batteries, or who generate other solid waste from the activities listed above, must determine whether the electrolyte and/or other solid waste exhibit a characteristic of hazardous waste (HW):**
  - If the electrolyte and/or other solid waste exhibit a characteristic of HW, it is regulated as HW.
  - If the electrolyte or other solid waste is not hazardous, the handler may manage the waste as solid waste.

BEST MANAGEMENT PRACTICES (BMPS)

Fires at end of life are common when dealing with lithium-ion batteries, and mismanagement and damage to batteries makes them more likely. Beyond following the universal waste standards, handlers of end-of-life lithium-ion batteries should take additional precautions to protect against the chance of thermal runaway and fire.

BMPs for Handling Lithium-Ion Batteries at End of Life

- **Safety training for all employees removing, disassembling, or handling the batteries;**
- **Isolating the terminals of the batteries with non-conductive tape, plastic bags, or other separation techniques, keeping the label legible;**
- **Preventing damage to batteries;**
- **Storing batteries in climate-controlled spaces with good ventilation;**
- **Storing batteries in a separate building away from other flammable materials and occupied spaces when possible;**
- **Storing batteries that have been identified as damaged, defective, or recalled (DDR) separately from non-DDR batteries in appropriate containers;**
- **Installing advanced fire detection and suppression equipment;**
- **Conducting frequent visual and thermal inspections of batteries;**
- **Having ongoing communications with local fire marshals and first responders about materials and processes happening on site; and**
- **Maintaining a plan for how to respond and evacuate in case of an emergency.**

ADDITIONAL RESOURCES

To learn more about the design and management of lithium-ion batteries, refer to the EPA memo from May 24, 2023: "Lithium Battery Recycling Regulatory Status and Frequently Asked Questions." If you have questions about managing spent lithium-ion batteries generated by a business, please feel free to contact us using the information at the end of this fact sheet. The forthcoming fact sheet on batteries will be made available online. ●

Keep an Eye out

TUHWR PLANNING

We want to thank participating facilities for submitting your toxic use and hazardous waste reduction (TUHWR) plans by the July 1 deadline. We look forward to your continued involvement and any opportunities you may pursue related to reducing toxic use and hazardous waste generation. If you would like to discuss TUHWR further or need assistance, please do not hesitate to reach out. Also, please note that interested facilities may request a compliance assistance visit (CAV) from our Program, which we offer without the threat of enforcement. As a courtesy reminder, be aware that the first Annual Progress Report and Annual Fee payment for the new cycle will be due March 31, 2024. All information and forms can be found on the TUHWR webpage.

For those that are not familiar, TUHWR planning was established in statute (10 V.S.A. §§ 6623-6633) to encourage facilities to reduce their use of toxic substances and/or their generation of hazardous waste. The TUHWR planning is required for facilities that use toxic substances and/or generate hazardous waste

beyond specific thresholds, and it is intended to provide those facilities with a summary of their toxics use and hazardous waste generation. The process of developing and monitoring a TUHWR plan allows the facility to consider alternative approaches that might result in reductions—it is ultimately up to the facility whether the alternatives identified in the plan are implemented. If you are unsure whether your facility is required to plan, or you are interested in learning more, please contact us using the information at the end of this newsletter.

UVM DRAFT PERMIT AVAILABLE FOR PUBLIC COMMENT

DEC has completed its review of the University of Vermont and State Agricultural College (UVM) application for renewal of its permit for storage of hazardous waste at their Environmental Safety Facility, located at 667 Spear Street, Burlington, Vermont. A draft permit has been prepared and is now available for public review and comment. The comment period will be open from August 14 through September 28, 2023. A public hearing on the draft permit has been scheduled for September 21, 2023, at 5:00 p.m. at the Waterman Building, Room 338 (Memorial Lounge), 85 S. Prospect Street, University of Vermont Main Campus, Burlington, Vermont. To view the draft permit, read the related fact sheet, or learn more about submitting comments, visit our Hazardous Waste Permitting webpage. ●

New Guidance Resources

If you have not already done so, please bookmark our webpage dedicated to Resources for Hazardous Waste Handlers. The Program will continue to add new information to this page as it becomes available.

Below are the resources that have been posted on our website since the last issue of the newsletter was distributed.

FACT SHEETS

Antifreeze: explains how spent ethylene-glycol-based antifreeze is regulated and covers best management practices.

Oil Filters: provides an overview of managing spent oil filters according to the conditional exemption in the VHWMR.

Oily Wastes: explains how to determine whether your oily waste is regulated as hazardous waste and provides examples of common oily wastes.

Pharmaceuticals: updated fact sheet to include additional considerations for healthcare facilities operating under Subchapter 10 as well as guidance on the NIOSH Hazardous Drug List and regulated medical waste. ●

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