RISK MANAGEMENT

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WASTE NOT, WANT NOT
An In-Depth Introduction to Universal and Electronic Waste

As the generation of universal waste (u-waste) and electronic waste (e-waste) continues to grow, so too does the challenge of safe and responsible waste disposal. This white paper is intended to provide a focused discussion on the regulatory classifications of u-waste and e-waste, the common types of risk exposures that handling, storage, transportation and disposal of these wastes creates and recommended best practices for properly managing these wastes.

Universal Waste

U-waste is a subcategory of hazardous waste promulgated in 1995 under the Resource Conservation and Recovery Act (RCRA). The Universal Waste Rule was written to promote collection and recycling of certain widely generated categories of hazardous waste by affording handlers more time to accumulate these wastes and in turn, allowing handlers and disposal facilities to manage, recycle and dispose of these wastes economically. After several amendments, the federal regulations now identify five specific categories of materials that can be managed as u-wastes: batteries, pesticides, mercury-containing equipment, lamps (e.g., fluorescent light bulbs) and aerosol cans.

State adoption of the federal u-waste regulations is optional in RCRA-authorized states. RCRA-authorized states have the primary responsibility of implementing the RCRA hazardous waste program in lieu of the United States Environmental Protection Agency (USEPA). These states must maintain minimum regulatory standards established by the USEPA, but are free to implement more stringent standards or to regulate additional waste categories as u-waste. Example state u-waste additions include antifreeze, ballasts, e-waste, paint and paint-related wastes and pharmaceuticals.

Electronic Waste

E-waste is defined by the USEPA as any waste electrical and electronic equipment that is dependent on electric currents or electromagnetic fields in order to function, including all components, subassemblies and consumables that are part of the original equipment at the time of discarding. Examples of e-waste include televisions, cathode ray tubes (CRTs), computers, cell phones, microwaves, refrigerators, washing machines, power tools and corded devices.

Regulations on e-waste recycling are primarily driven by states. Twenty-five states plus the District of Columbia have laws that require e-waste recycling. Eighteen states (not mutually exclusive) have landfill disposal bans. Most states use the extended producer responsibility model, which requires manufacturers to pay for the disposal of electronic products they make. Notable exceptions to this are California, which places responsibility on the consumer by employing an advanced recycling fee model, and Utah, which requires manufacturers to educate consumers about recycling best practices. Although there are no promulgated federal regulations for e-waste, waste that is defined as hazardous under RCRA are still subject to hazardous waste regulations. In some states, disposal of e-waste is regulated within the state's Universal Waste Program, and in many states the handling, storage and transportation of e-waste closely mirror that of u-waste. Because e-waste laws differ from state to state, manufacturers that operate in multiple states must adhere to each state's regulations. In addition to state regulations, there are voluntary standards and certifications for e-waste recycling. For example, the e-Stewarts program (Standard for Responsible Recycling and Reuse of Electronic Equipment) addresses key weaknesses of many e-waste regulations, including the export of e-waste to developing countries, incineration/landfilling of e-waste, worker health and safety and use of prison recycling operations.

Universal Waste Handling and Storage

Handlers generate and/or consolidate u-waste before sending it to another handler, recycler or treatment, storage and disposal facility (TSDF). Handlers accumulate u-waste but do not treat, recycle or dispose of the waste.

U-waste handlers are categorized based on the amount of u-waste they accumulate onsite at any one time:

- Small Quantity Handler of Universal Waste (SQHUW) – Accumulates less than 5,000 kilograms (kg) of all u-waste categories.
- Large Quantity Handler of Universal Waste (LQHUW) – Accumulates 5,000 kg or more of all u-waste categories.

Once the LQHUW status is triggered, the handler will remain a LQHUW for the remainder of that calendar year. However, the handler status can be re-evaluated at the start of each calendar year. LQHUWs must maintain records of all u-waste shipments received by and sent from the facility, while SQHUWs have no recordkeeping requirements under the u-waste rule. LQHUWs are also required to obtain a USEPA identification number. Other key requirements for both SQHUWs and LQHUWs include:

- Appropriate waste storage – u-wastes must be stored in containers that are closed, structurally sound, compatible with the wastes and lacking evidence of damage that could cause leakage. Containers should be stored indoors on a level and solid surface free from puddling.
- Correct labeling of waste containers – containers must be labeled with the date the material was generated, when it became a waste, or when it was received from another handler.
- Employee training – u-waste handlers are required to ensure employees are knowledgeable about proper handling and emergency procedures.

Handlers should also be familiar with all disposal bans and regulations that would affect the waste stream.

Transporters

Transporters move u-waste shipments between handlers or to destination facilities. Persons hauling any amount of u-waste are subject to the u-waste transporter regulations as well as the Department of Transportation (DOT) regulations. Similar to hazardous waste transporters, u-waste transporters may store the waste at a transfer facility for up to 10 days; exceeding the 10-day limit requires compliance

with the applicable handler regulations. All transporters must be licensed and trained. The training includes proper loading and unloading of the wastes in addition to spill prevention and response.

Destination Facilities

Destination facilities treat, dispose of or recycle u-waste. A destination facility is subject to full hazardous waste regulations as a TSDF including permitting, general facility standards and unit-specific labeling/marking standards. Key responsibilities of destination facilities include accepting and tracking all waste deliveries from transports, proper handling and storage of waste (discussed above) and ultimately treatment, disposal or recycling of the waste. Records of shipments must be retained for at least three years from the date of receipt of the waste shipment.

Rules and regulations have been established involving the disposal of specific e-waste materials. For example, the USEPA has developed notification requirements for shipments of CRTs to other countries in order to encourage recycling and reuse of used CRTs. In addition, 18 states have e-waste landfill disposal bans that prohibit the disposal of specific e-waste products (e.g., desktops, laptops, CRTs, flat panel monitors, printers, etc.) in landfills. The list of landfill-banned e-waste products is specific to each state.

Risk Exposures

Since media quality data is often limited or nonexistent for u-waste or e-waste facilities, the risk exposures associated with these facilities are often difficult to quantify. At facilities where pollution conditions do develop, they are most likely to occur due to human error, acceptance of non-universal hazardous waste (e.g., breached batteries or crushed lamps), improper storage of incompatible wastes, failure to maintain equipment, truck roll-overs, disposal at unpermitted or incorrectly permitted facilities or catastrophic events such as fire or explosion.

A low risk handler, transporter or destination facility is typically characterized by a lack of notices of violation, frequent in-house and regulatory inspections, good storage practices, good housekeeping, lack of ambient odors, good driving/transportation records, timely and comprehensive employee training and up-to-date emergency plans and procedures. Facilities with positive compliance records are comparatively less likely to experience a release and are more likely to respond promptly and effectively to releases that do occur. In cases where media quality data is lacking, records of compliance become critical in assessing risk exposure. Compliance issues may arise from generally poor housekeeping or poor practices during handling, storage, transportation or disposal of waste. Because most releases stem from compliance issues, a facility with a positive compliance record is exposed to significantly less risk than a facility with a poor compliance record. Facilities with non-compliance issues involving fines and penalties are more likely to require soil remediation or a larger remedial action that could involve groundwater remediation or engineering and institutional controls (e.g., deed restrictions). Furthermore, a vacant/abandoned facility that was previously used to handle, transport or receive waste and which is undergoing redevelopment could contain waste that was not accounted for and that will need to be disposed of, likely at significant cost.

Based on past project experiences of Roux, cleanup costs for a release can vary from approximately $25K-50K for small pollution events, to $100K-250K if groundwater cleanup is required, to as high as $1MM if abandoned waste that requires disposal is identified.

Best Practices

By following best practice operational guidelines, u-waste and e-waste handlers, transporters and disposal facilities can considerably diminish the likelihood of a release or other environmental condition. In order

to effectively follow best practice guidelines, a facility must comply with applicable federal and state regulations, keep written plans for relevant procedures and protocols, prepare for and pass audits and inspections, conduct timely and comprehensive employee training, properly store waste, enforce usage of proper PPE while handling waste and promptly respond to issues if and when they occur. In addition to conforming to internal best practice guidelines, facilities should also be familiar with state checklists/guidelines for u-waste and/or e-waste management where available.

A selection of recommended resources is provided on the next page for additional details regarding u-waste and e-waste compliance tips and best practices. Additional information can also be found on the USEPA website at https://www.epa.gov/hw/universal-waste and https://www.epa.gov/smm-electronics.

Conclusion

U-waste and e-waste are common hazardous wastes that are generated by many businesses and that must be handled, stored, transported and disposed of in accordance with applicable federal and state regulations. Handlers, transporters, and disposal facilities must establish a strong understanding of applicable regulations in order to maintain positive compliance records and to minimize the risks associated with u-waste and e-waste.

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Resources

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