

Tips for Safe Disposal of E-Cigarettes and Nicotine Waste



E-cigarettes, including rechargeable batteries and the cartridges and bottles that contain e-liquids (liquid nicotine mixtures), can pose a threat to human health and to the environment if they are not disposed of properly. E-cigarette and e-liquid waste should not be thrown in the regular trash or flushed down a sink. Instead, these items should be taken safely to a hazardous waste facility. This article provides tips for schools and others about safe e-cigarette and nicotine waste disposal.

Nicotine Is an Acute Hazardous Waste

Nicotine, including nicotine salt, is listed by the Environmental Protection Agency (EPA) as an acute hazardous waste.¹ Discarded or neglected vaping products may contain harmful substances, including unused liquid nicotine.^{2,3} Improper storage and disposal of these items may lead to unintentional exposure and accidental nicotine poisoning. Poison control centers receive thousands of calls per year about exposures to liquid nicotine, which can be fatal to small children involved in accidental exposures.⁴⁻⁶

Improper disposal of e-cigarettes and e-liquid products can hurt the environment. If thrown in the trash or flushed into the sewer system, the nicotine solution in an e-liquid product can seep into the ground or water and become a danger for wildlife and humans.^{7,8,9} As e-cigarette batteries degrade, the compounds in them can also seep into nearby water. Additionally, lithium ion batteries have been linked to explosions in recycling trucks when batteries are not properly disposed of.¹⁰

Best Practices for Safe Disposal

The following are best practices and information compiled from state departments of health and public health nonprofit organizations:

- Schools and other institutions should first check with their state and local environmental agencies for rules and guidance about e-cigarette and nicotine product waste disposal.
- When confiscating a device, make sure the user of the product has turned off the battery. Some e-cigarette devices with a “push button” could be activated when placed against other items in a pocket or storage container. If the e-cigarette appears to be rechargeable, then also ask the user to remove the rechargeable battery.

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- Collect all e-cigarette-related products, including devices and filled or unfilled nicotine cartridges. Store these items in a cool, temperature-controlled environment, in a safe, sealed, clearly labeled container for hazardous waste. Take care that any items containing rechargeable batteries are stored in a temperature-controlled environment.
- If possible, store rechargeable batteries in a separate container for hazardous waste. Though rechargeable batteries may be recyclable, do not attempt to remove the battery on your own. It may be best to allow trained workers at a hazardous waste facility to remove the batteries from the nicotine-containing devices.
- Regularly deliver the sealed container of e-cigarette waste to a local hazardous waste facility. Since rechargeable batteries have been linked to explosions, delivering the waste at least every 90 days may be a good safety guideline.
- Always be careful handling confiscated or discarded e-cigarettes, e-liquid products, and batteries. Liquid nicotine can be absorbed through the skin and cause accidental poisoning.
- Used and discarded pods often contain unused nicotine. Handle these items carefully to avoid unintentional exposure and do not throw them away in the regular trash.
- Do not throw rechargeable batteries into the trash.
- Do not rinse e-cigarette items, such as spent cartridges, to remove the liquid nicotine residue. That water will become hazardous waste, and you will need to store and dispose of the water properly.

E-Cigarettes Might Not Be Hazardous Waste If Recycled

The EPA published an opinion letter in 2015 stating that if nicotine products like e-cigarettes were legitimately recycled, they would not be subjected to hazardous waste regulation.¹ Organizations such as Call2Recycle may be able to recycle lithium ion batteries. If items could be recycled, that waste would no longer be subject to the same hazardous waste regulation requirements for safe disposal.

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Additional Information to Help Schools and Others

As sales of e-cigarettes have increased significantly in the past few years, institutions face a burden to dispose of e-cigarette waste in a way that protects human health and the environment. Schools face challenges both with confiscated e-cigarettes and with waste littered by students on school property. The most important step is to contact state and local environmental agencies to learn of specific guidelines. Please also review these additional resources:

- Disposing of E-Cigarette Waste: FAQ for Schools and Others:**
<https://www.publichealthlawcenter.org/sites/default/files/resources/Disposing-of-E-Cigarette-Waste-FAQ-for-Schools-and-Others.pdf>
- Minnesota Pollution Control Agency: Vaping Liquids, E-cigarettes and Nicotine Wastes:**
<https://www.pca.state.mn.us/sites/default/files/w-hw4-65.pdf>
- Colorado Department of Public Health & Environment: Vaping Liquids, E-cigarettes and Nicotine Wastes: Guidance for businesses, government agencies and schools handling nicotine-containing wastes:**
<https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/434101>

References: (1.) EPA opinion letter on e-liquid as hazardous waste: <https://rcrapublic.epa.gov/files/14850.pdf>; (2.) Krause MJ, Townsend TG. Hazardous waste status of discarded electronic cigarettes. *Waste Manag.* 2015;39:57-62; (3.) Hendlin YH. Alert: Public health implications of electronic cigarette waste. *American journal of public health.* 2018;108(11):1489-1490; (4.) Wang B, Liu S, Persoskie A. Poisoning exposure cases involving e-cigarettes and e-liquid in the United States, 2010-2018. *Clin Toxicol (Phila).* 2019;1-7; (5.) Bassett RA, Osterhoudt K, Brabazon T. Nicotine poisoning in an infant. *The New England journal of medicine.* 2014;370(23):2249-2250; (6.) Eggleston W, Nacca N, Stork CM, Marraffa JM. Pediatric death after unintentional exposure to liquid nicotine for an electronic cigarette. *Clin Toxicol (Phila).* 2016;54(9):890-891; (7.) World Health Organization. *Tobacco and Its Environmental Impact: An Overview.* 2017. <https://www.who.int/tobacco/publications/environmental-impact-overview/en/>; (8.) Krause MJ, Townsend TG. Hazardous waste status of discarded electronic cigarettes. *Waste Manag.* 2015; 39:57-62; (9.) Hendlin YH. Alert: Public health implications of electronic cigarette waste. *American journal of public health.* 2018;108(11):1489-1490; (10.) EPA presentation on lithium ion battery explosions in the solid waste system: https://www.epa.gov/sites/production/files/2018-03/documents/timpane_epa_li_slides312_ll_1.pdf.

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