

Analysis of all Waste Streams Acme Chemical Company



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Outline



- **Waste streams at Acme**
- **EPA waste treatment standards**
- **Waste that Acme produces**
- **How to reduce/prevent waste**
- **How can Acme reduce/prevent waste**
- **Conclusion**
- **References**

What are the waste streams at Acme?



- **Classified as hazardous or nonhazardous**
 - hazardous- waste that is dangerous or potentially harmful to our health or the environment
 - nonhazardous- municipal solid waste and industrial waste
- **Waste treatment is traditionally done in the past**
 - treating the waste after it is formed to remove harmful toxins

<http://www.epa.gov/osw/index.htm>

EPA Standards for Waste Treatment



- **Combustion or incineration**- treatment of hazardous waste to destroy hazardous organic constituents and reduce the volume of waste
- **Disposal facilities**- placement of waste into or on the land to permanently contain the waste and prevent the release of harmful pollutants to the environment
- **Underground injection**- disposal method for liquid hazardous waste, but have a potential to impact drinking water resources and are regulated under the Safe Drinking Water Act (SDWA) and Underground Injection Control (UIC) Program

<http://www.epa.gov/osw/hazard/tsd/td/index.htm>

EPA standards for Waste Treatment



- **The Resource Conservation and Recovery Act (RCRA)**
 - general guidelines for the waste management program by Congress
- **Hazardous Waste Program**
 - system for controlling hazardous waste from the time it is generated to its disposal, “cradle to grave”
 - hazardous waste falls into two categories
 - Listed Wastes
 - Characteristic Wastes
- **Non-Hazardous Waste**
 - regulation for solid waste

What waste does Acme produce?



- **Toulene**- clear, colorless liquid is produced from making gasoline and other fuels from crude oil and is a hazardous solvent
- **Hydrochloric Acid**- colorless liquid with a sharp odor and considered a hazardous waste because of it's corrosive properties
- **Sodium Hydroxide**- corrosive base
- **Acetone**- liquid that is an ignitable waste
- **Organic Peroxides**- reactive waste that are unstable, react violently with water, and capable of an explosive reaction when heated or exposed to shock

What waste does Acme produce?



- **Bleach**- under Regulation EEC 793/93 is safe for the environment in all its current uses
- **Ethyl Acetate**- ignitable waste
- **Formaldehyde**- toxic and volatile, exposure is a health risk
- **Nitrogen dioxide**- toxic air pollutant
- **Aqueous Alkaline waste**- 3 tons produced per year
- **Distillation residues**- flammable, smelly and toxic; sent for incineration
- **Phosphoric Acid**- corrosive acid
- **Aqueous Alkaline Layers**- 2.5 tons produced per day, currently neutralized after being produced

How to reduce waste



- **Reduce-** limit the amount of input materials that need to be used
- **Reuse-** utilize materials instead of disposing them
- **Recycle-** if the waste can't be reduced or reused then recycle the appropriate materials

How can Acme prevent and reduce waste



- **Invest in new technology to retrieve and recycle waste**
 - may be expensive to invest in, but in the long run will reduce costs
- **If it can't be recovered it could be treated before discharge to neutralize them or remove toxic pollutants (BATNEEC principle)**
 - more cost for company but can reduce harmful pollutants released
- **Comprehensive Procurement Guidelines (CPG)**
 - guide for purchasing recycled materials, including recommendations for recycled-content levels for CPG items

How can Acme prevent and reduce waste



- **The Pollution Prevention Act (1990)**

- use as a guide to focus on reducing pollution through cost-effective changes in production, operation and raw materials

- Waste Reduction At Source (WRAS)

- reducing use of resources

- **Full Cost Accounting (FCA)**

- approach to identify the cost of managing solid waste operations and measures for streamlining and improving operations

Conclusion



- **Reviewing our managing operations to improve and therefore reduce waste products**
 - review input materials
- **Invest in new technology to reduce harmful chemicals released into the environment**
 - reuse the chemicals produced in our output streams
- **Review CPG to determine if we can use recycled materials to reduce our harmful impact on the environment and possibly reduce costs**

References



CHEM 321 Unit 6 Slideshow, Walker

U.S. Environmental Protection Agency, hazardous waste regulations, www.epa.gov/epawaste/laws-regs/regs-haz.htm

U.S. Environmental Protection Agency, resource conservation, <http://www.epa.gov/epawaste/conserve/index.htm>

<http://www.atsdr.cdc.gov/tfacts56.pdf>

<http://water.usgs.gov/admin/memo/policy/wrdpolicy94.006.html>

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