

The Love Canal

The Love Canal did not start with the intentions of turning into a disaster, but it slowly spiraled into an environmental crisis. It started in the 1800s in Niagara Falls, NY, when William T. Love attempted to connect the upper and lower Niagara River; his dream ran short when he ran out of money before completing his project. The canal was 60 ft. wide and 3,000 ft. long. The canal was then sold at a public auction and turned into a dump site from 1920 to 1953. The main disposer at this site was Hooker Chemical Corp., which disposed more than 200 different chemicals, including pesticides, solvents, polychlorinated biphenyls and heavy metals.

After the canal was filled, Hooker covered it with dirt and sold the land to Niagara Falls Board of Education. A “warning” was given with the deed about the chemicals buried beneath along with a disclaimer relieving Hooker from any liability in the future regarding the canal. Regardless, a community was built over the chemically covered land. It started with an elementary school on the perimeter in 1954 and grew into hundreds of homes by 1978. After a record amount of rainfall, leaching of the chemicals began surfacing all around the community in backyards, basements, school playgrounds, etc.

On Aug. 2, 1978, the New York Commissioner of Health declared a health emergency, and the governor offered to purchase homes closest to the canal and to relocate families. On Aug. 7, 1978, President Carter approved emergency financial aid for the Love Canal area. These were the first emergency funds ever to be approved for something other than a natural disaster.

PROBLEM

Not only did the events at Love Canal rip families out of their homes, but it also tied into many health problems. Some health effects associated with the Love Canal are birth defects, miscarriages and cancer. According to Paigen (1982), an investigation was done to prove an increase in health defects among those who lived on site. A threefold increase in miscarriages occurred in pregnant women. Of the 64 women living in homes at Love Canal who were pregnant, five had three or more miscarriages. The probability of this occurring was less than 0.001.

Birth defects were also higher in homes located on the wetland of the Love Canal. Some of the birth defects included club feet, webbed toes, missing ears and extra teeth. More serious defects included heart defects, missing or nonfunctional organs, deafness and retardation.

CHEMICALS

Among all chemicals found at Love Canal, some caused minor health effects, such as skin irritation caused by dibromoethane and benzoic acid, but others were more serious. Since the chemicals became airborne, they caused respiratory conditions as well. Some of the major chemicals associated with Love Canal include benzaldehyde, which is an allergen, and benzene, which is a skin irritant with chronic effects, such as leukemia and anemia. Carbon tetrachloride is tied to acute effects, such as hepatitis and kidney damage, and chronic effects, such as liver tumors. Chloroform caused central nervous narcosis, skin and respiratory irritation, and stomach symptoms. The main chemical found was dioxin, which was most severe in its health effects; chronic effects included nervous system disorders and psychological abnormalities. Dioxin was associated with cancer, spontaneous abortions and liver dysfunctions when studied in animals.

REGULATIONS

At the time of the Love Canal dilemma, no regulations existed regarding such an event. There was no record of what chemicals or waste was put into the space, and the Love Canal was not the only problem. Many sites were ticking time bombs just waiting for this to happen again. At that time, it was hard to keep track of what companies were dumping and where they were doing it. Now the U.S. has hazardous waste regulations. In 1976, the Federal Resource Conservation and Recovery Act (RCRA) was enacted to give EPA authority to regulate the generation and disposal of dangerous and hazardous materials.

Hazardous waste in landfills is now approached in a much different manner. Certain specifications must be met when creating a landfill for hazardous waste. It is done differently than the techniques used at the Love Canal; instead of just dumping all types of chemicals into a ditch and covering it up with dirt, a regulated process must be completed.

The process includes an adequate design, operation and closure. The design includes three levels of safeguards, the primary layer consisting of an impermeable liner along with a leachate collection system to allow movement of the waste. The second system is another barrier as a backup leachate collection system. The third safeguard would be a system with a series of discharge wells to monitor the groundwater in the area for backup if the primary and secondary barriers fail.

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As for proper operation of the hazardous waste landfill, wastes should be separated by physical and chemical characteristics and buried accordingly. Observation of the sites should be regular and should include soil samples to confirm the integrity of the lining materials. Finally, a site should never accept any more waste once it is closed. The cap on landfills must be maintained and inspected to ensure proper closure. Runoff water must be collected and treated if necessary. Monitoring of groundwater, soil and air must be continuous. Inventories of waste must be kept and burial maps maintained for future use.

At this point, each state has its own regulations and rules regarding hazardous waste management. Each chemical can be put into a hazardous waste category and then be disposed of properly.

ALTERNATIVES

It is impossible to rid the planet of all chemical wastes, however; some alternative methods are available to store them. One option is recovery alternatives, which means that what may be useless to one person may be useful to another. Clearinghouses help companies anonymously trade and negotiate transfers for certain chemicals. Another option is materials exchanges, which aid in a transfer of the wastes. This process can be more complex, but it is still a better alternative to landfills.

Incineration is another alternative to landfills. Although burning waste can be more costly, it comes with some advantages. Hazardous waste can be incinerated in a controlled manner, can be applied to most organic wastes, can handle large volumes of liquid waste, is a best method to eliminate mixed waste and does not require large land areas, such as landfills.

CONCLUSION

The Love Canal was a huge environmental disaster and a wakeup call for the U.S. It is unfortunate that it needed to come to such a tragic event before any regulations were set forth on chemical wastes. It is hard to believe that at one point it was acceptable to dispose of such dangerous chemicals without any consequences. At least RCRA has now set forth rules and regulations. The hazardous waste program is a system for safely controlling hazardous waste. Each state has its own hazardous waste rules established by EPA or by the state hazardous waste regulatory agency. Even though it is impossible to make the chemicals disappear, more options are available now than there were at the time of the Love Canal, and it is great that we are making progress.

As of 2004, the Love Canal was removed from the Superfund list. It was recorded to meet the cleanup goals. Today, the area is up and running again as a family community. There are renovated homes and apartment buildings, and some area east of the canal is sold for industrial and commercial redevelopment. ☺

RESOURCES

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