

Sanitary Landfills were once called garbage dumps. A dump was a place used by everyone in the community and was often left unattended. The property was sometimes private land and sometimes owned by cities or counties. Dumps were located away from areas where people lived and were havens for rats, flies and other disease vectors. In some areas dumps attracted bears and even had entry road signs directing tourists "To the bears".

Every unwanted article went to the dump. There were old cars, dead animals, bedding, household garbage and even industrial chemicals. Fires were a common sight as burning material was dropped into the garbage pile and left to burn. Fires were often started by the operators to make more space in the dump.

People often found things in the dump and took them home, risking the spread of diseases.

The garbage was rarely covered so rain carried contaminants into streams and into the groundwater. Many dumps were located near, or even in water and shoreline areas affecting rivers, bays and estuaries.

Odor from the decaying material was overpowering on hot summer days, flies were everywhere and litter from the open piles of garbage blew away from the dump. Some of the worst dumps were generated by industrial operations such as slaughter houses, oil fields and mineral and food processing. All dumps had some impact on the environment.

Sanitarians, now called Environmental Health Specialists, regulated dumps. When an operator could be found, and when the site had a fence, they might instruct the operator to "shoot the rats, put out the fires and lock the gate when you leave". Regulations offered almost no environmental protection and little nuisance control. A dump was a stinky, awful, even hazardous place that was unwanted near homes or businesses.

Recognition of the environmental impacts caused changes in solid waste management. The Sanitary Landfill was a first step in reforming operating standards. A Sanitary Landfill required that garbage be covered with soil at the end of each day and that other controls be initiated to prevent or reduce the impacts of problems mentioned above. Many other changes have occurred since that first step and today there are stringent requirements for the operation of a landfill.

Modern landfills are like huge containers. They have liners that separate the waste from the groundwater. Liquid which has percolated through the garbage is called leachate. Dumps allowed leachate to soak into the ground and contaminate the groundwater. Landfill liners prevent leachate from passing into groundwater. Modern landfills have leachate collection systems and the leachate is transported to treatment plants where clean water is produced and pollutants are removed. Water that runs off the site is monitored for contamination and is treated prior to release if contamination is discovered.

Methane gas is produced in the anaerobic breakdown of garbage in the landfill. Collection systems for landfill gas are required and the methane is burned or used sometimes for the production of electricity, to prevent air pollution.

Roads used by garbage trucks are monitored for mud and for litter. Mud is cleaned from the roads during wet weather and generation of dust is not allowed during dry weather. Water trucks are required to spray unpaved roads and construction areas when in use. Litter collection is part of daily landfill operation and litter fences to stop litter migration are installed on the landfill.

Modern landfills are not allowed to accept certain materials and are built for disposal of specific types of material. Only a specific class of landfill designed for special wastes is allowed to accept dangerous or hazardous materials. The type of waste received at a landfill is specifically stated in the Solid Waste Facility Permit issued by the LEA. Waste entering the landfill is monitored and material that is not allowed is rejected by

the operator.

The modern landfill is expensive. The cost of a landfill is paid for by the people and businesses that dispose of garbage. The cost to the "ratepayer" is determined by projecting the cost of operating the landfill, the cost of closing the site as well as the cost for developing the facility. Estimates for developing a landfill are in the 1 million dollars per acre range. Financing a project of this size requires the ability to project the amount of garbage that will be disposed of in the landfill. The unused landfill space is known as "airspace". Airspace is the empty room that can still be used for waste disposal within the approved landfill design. Community planning usually allows for sufficient airspace for approximately 30 years of disposal; without the airspace, growth of a community could be restricted. Communities must plan for garbage disposal as they develop.

Expensive airspace has made the placement of garbage a great concern. Heavy equipment weighing over 50 tons and costing three quarters of a million dollars per unit is driven back and forth over the garbage. The result is compaction. Material coming from a household trash bag weighs about 300 to 500 pounds per cubic yard. The same material after compaction in a landfill usually weighs 1200 to 1700 pounds per cubic yard. Compaction allows more cubic feet of garbage to go into the landfill which is an important factor in landfill economics. Compaction also offers another benefit: Rats and other disease carrying vectors do not survive the modern landfill compaction process.

Finally, when a landfill has reached its capacity, there is regulation of the closure process. A full landfill is covered with material that is similar to the material found in the bottom liner. Once all the airspace is consumed the landfill systems must be maintained for 30 years under post-closures requirements to prevent environmental damage or nuisances from occurring. As the garbage degrades, waste volume in the landfill is reduced. This causes subsidence and sink holes develop in the landfill surface. There are often land surface changes that require filling and repair. Vegetation is required on the surface of a closed site and every attempt is being made to return the land to a natural state using appropriate, often native, plants. Alameda County currently has 22 closed sites which are monitored by the LEA.

Modern landfills are a great asset to our standard of living, as anyone living in an under developed country or who has endured a lengthy garbage strike, can verify. They provide a safe, healthful and economic way to dispose of society's waste and in an environmentally protective manner. In the future, landfills could become sources for energy as methane gas is used to generate electricity. Present technology is rapidly changing and the landfill may one day even be regarded as an asset where scarce materials can be found.