

Leachate Treatment Facilities: Teamwork for a Turnkey Facility

Leachate at landfills will change over time. Working with a team that will help to ensure employees' safety is incorporated, proper maintenance can be completed and future expansion of the treatment facility is worked into the design should be a high priority.

■ By Jeff Eriks

Leachate treatment facilities are a key part of any landfill design. The treatment of the liquids generated through the process and life of a landfill are necessary in many locations prior to discharge. When beginning to research methods and options for treating liquids, it is important to involve experts in the analysis and treatment of the waste to evaluate the liquid and determine the correct treatment method. The determined method is standardly based on the leachate's current make-up and the end result required by the receiving party. These specialists will typically begin with a pilot study to develop a "basis of design" for what needs to be done to treat the liquid and what equipment should be used. This pilot study will generally look at the needs for today and project what the future needs might be in the years to come, knowing both the volume and make-up will change. This information can be used to select a process equipment supplier and add your design/build team immediately following in order for them to work together to

develop the design for the facility, factoring in the equipment, safety, efficiency, storage and durability for the application. The quantities of liquid also need to be understood in order to properly size the system and the tanks that will be needed to store the untreated and treated liquid prior to treatment or discharge. All of these factors will help determine the amount of space that will be required to construct the plant. The team tasked to work on this project will need to take into account some key factors including the location, interior features, building design and safety.

Location

The location of the new facility is important since it needs to be placed where the leachate lines can come together and the discharge line can also be easily accessed. The leachate treatment facility should be located in an area where future landfill cells are not affected and

Leachate tank and treatment facility under construction.
Photos courtesy of Cambridge Companies.



there is enough ground area to accommodate future growth and expansion of the system.

Building Design

The design of the building will be dependent on the equipment required and the different types of spaces that are needed. Collateral loading, or weight of all items hanging on the walls/ceilings, should be factored into the building design. The weight of the pipe, both empty and filled, needs to be factored into the design of walls and roof so that you can ensure the additional weight of these materials will not negatively affect the long-term performance of the building. High-level lighting and tall ceilings should be used throughout for both operation and maintenance of the facility. The building should be designed with proper height clearances so the equipment can be easily installed.

The building should be properly ventilated to meet local air quality standards and more importantly for the health and welfare of your employees. Oftentimes, you will have locker rooms, restrooms and lunchrooms in this facility as well. Employee areas should be separated from the process area so it is in a clean and safe environment. A lab area should be adequately sized for the needs of the leachate treatment facility and house the necessary equipment needed for employees to test the material as required. The entire interior of the building should be “washable.” “Washable” qualities include solid walls, whether concrete or metal liner panel and other surfaces that are easy to clean. Several overhead doors should be placed in the facility at key locations for access to equipment and so equipment can be added/replaced in the future with ease.

Water and electricity do not mix; it is important to ensure electrical panels are located in a separate room and are enclosed with the proper materials. When possible, provide a segregated shop area to conduct repairs on equipment or components. Typically, the parts storage would also be located in this area. A plan should also be in place for solid and liquid chemical storage, including how to offload chemicals from inbound trucks, what is a sufficient storage location for all materials, and how to get chemicals to the location where they are pumped or dumped into the equipment.

Interior Features

The interior features of a leachate treatment facility should specifically take into account equipment maintenance factors. The building should be equipped with hoisting equipment over certain equipment for proper servicing. Some pieces of equipment, such as the filter press, require access to clean out solids and residue that gather within the equipment. These pieces of equipment need to be identified and the maintenance process clearly defined so the design team can plan for these activities. The disposal method for these solids will also need to be identified and planned into the process and design. Housekeeping pads are typically located underneath certain pieces of equipment so employees can easily clean under/around all the equipment as required. Trench drains need to be located in locations of potential discharge points and for periodic wash down of the floor.



Air/water connections and convenience outlets are another important factor in the design of the leachate treatment facility. In order to properly maintain and clean the facility, there should be ample compressed air high-pressure water connections and electrical outlets throughout the building and around the equipment in strategically placed locations based on the equipment layout. Stairs and platforms should be located in key locations for servicing the equipment. These should be constructed of materials that are proper for the environment and are slip resistant.

Safety

The safety of the employees and operations are key to the design of the facility. Easy access and ample lighting around the equipment for maintenance should be built into the design. Along with this, safety showers and eyewashes should be located throughout the facility on the main floor area as well as on platforms. Finally, safety tie-offs should be located in key areas of hard to reach locations.

Turnkey Facility

This is meant to be a high-level list of items to factor into a leachate treatment facility design. The actual equipment selected will drive many more decisions that will need to be made and key design features to be included in the facility. It is imperative to work with a company that has the experience necessary to help plan for these factors.

At the end of the process, the goal should be that the entire team provides a turnkey facility that will meet the required needs for years to come. This process should accommodate growth, proper treatment of current liquids and modifications to meet future demands as the leachate changes over the life of the landfill. The building and equipment should be adaptable to future needs quickly and cost-effectively while not affecting current operations. | **WA**

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