SAN SILVESTRE TECHNICAL PROCESS DESCRIPTION FOR LEACHATE TREATMENT

Leachate is generated through the natural decomposition of organic materials within the landfill mass, combined with rainwater infiltration. This liquid is systematically collected through an engineered network of collection pipes and monitoring wells integrated into the landfill infrastructure. The treatment requirements are determined by analyzing key parameters including Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), electrical conductivity, and chloride concentrations. These parameters ensure compliance with environmental regulations and quality standards, establishing the foundation for appropriate treatment protocols.

Primary Biological Treatment:

The facility implements a comprehensive on-site leachate management system, beginning with anaerobic treatment lagoons. In these lagoons, specialized bacteria break down organic matter in an oxygen-free environment, achieving significant reduction in both organic load and pathogen levels. This primary treatment stage is crucial for managing the high-strength characteristics of landfill leachate, providing a cost-effective and environmentally sound initial treatment step.

Secondary Treatment and Aeration:

Following anaerobic treatment, the leachate undergoes aerobic treatment in aerated lagoons. Mechanical blowers provide oxygen to support aerobic decomposition processes, enhancing nitrogen removal through nitrification and further degrading organic matter. This secondary treatment stage significantly improves water quality by reducing remaining organic compounds and adjusting key parameters to prepare the leachate for final treatment stages.

Advanced Purification and Reuse:

The final treatment phases employ activated carbon filtration followed by reverse osmosis. Activated carbon effectively removes residual compounds through adsorption, while reverse osmosis provides up to 99% removal of remaining contaminants. This advanced treatment train produces high-quality treated water that meets stringent environmental standards. The treated water is safely reused for operational purposes such as equipment washing and landscape irrigation, demonstrating commitment to environmental sustainability and water conservation practices.

LEACHATE TREATMENT PROCESS