



Historically, slaughterhouses were located along rivers to facilitate waste removal. Prior to the US Clean Water Act of 1972, untreated slaughterhouse waste damaged waterways because of its high biochemical oxygen demand (BOD). Slaughterhouse waste is high in calorie rich fats and protein. Dumping this in waterways provides aquatic microorganisms a cornucopia of food that results in their logarithmic reproduction. Treating slaughterhouse wastewater is important for prevention of high organic loading to municipal wastewater treatment plants. The most common methods used for treating slaughterhouse wastewaters include fine screening, sedimentation, coagulation, flocculation, and filtration.

Slaughterhouse Wastewater Treatment

In a slaughterhouse, wastewater can be generated from a variety of sources: washing carcasses, processing offal, cleaning equipment, stockyards, any rendering process, chillers, vehicle wash facilities, etc. There also a number of noncontact sources: storm water, cooling water (vacuum pumps, air conditioners, compressors), steam condensate, etc. The amount of wastewater generated depends on the age of the plant (new plants tend to be designed for less water use) and the plant practices (i.e. wet vs. dry cleaning practices).

The amount of wastewater generated can range from several hundred to several thousand gallons per head of cattle processed.

Screening

Screening is the preferred pretreatment for almost every waste stream. Removal of large solids not only produces a source of renderable materials with monetary value, but also reduces the solids, biochemical oxygen demand (BOD), oils and grease levels requiring treatment by downstream processes. Screens accomplish this without the addition of chemicals and with minimum energy input.

However, proper screen selection is vital to having a treatment system which is highly efficient and easy to operate and maintain. Screens must be designed to operate with a minimum amount of cleaning. WesTech offers a complete line of screens designed for each waste stream.

Striking a Balance

A well-designed wastewater treatment system strikes a balance between streams which are best kept segregated, either due to recoverable byproducts or because of the difficulty and/or cost of treatment (i.e. blood, manure, etc.), and streams which can

be combined for the equalization of flow rates and levels of contaminants. Any wastewater treatment process performs best when treating a stream which is constant in its levels of constituents (either high or low). This is especially true with biological treatment. The number and type of microorganisms adapt to the amount and type of nutrients available.

After screening and equalization, the majority of the wastewater is sent to a dissolved air flotation (DAF) unit where fats, oil and grease (FOG) are floated to the surface and skimmed off to a sludge holding tank. Heavier solids settle and are also sent to this same tank. These materials may have value as renderable materials. The water from the DAF is sent to biological treatment for BOD removal.

WesTech STM-Aerotor™

The WesTech STM-Aerotor™ employs a combination of activated sludge and fixed film to consume the biological material. This allows the unit to better handle swings in contaminant levels associated with daily cleaning cycles and to survive weekend periods of low BOD levels. The effluent from the STM-Aerotor is processed the same as conventional activated sludge in a WesTech COP™ clarifier.

From the COP clarifier, a portion of the sludge becomes recycled activated sludge (RAS) which is recycled back to the STM-Aerotor to maintain a high microorganism population. The remainder of the sludge becomes waste activated sludge (WAS) which is sent to a thickener. This unit thickens the sludge and discharges it to the sludge holding tank. It should be noted that the skimmings and sludge from the DAF are not sent to the thickener as they are already in a thickened state from the DAF and would not benefit from further settling time. Sludge from this tank is pumped to a filter press for dewatering.