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Volatile Organic Carbon (VOC) Removal

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Multiple types of equipment are used for mechanical oxidation and **Volatile Organic Carbon (VOC)** removal. The most common and efficient is positive draft aeration. Counter-current flow of air and water is created in cylindrical or rectangular vessels. Loose fill of special shaped media increase contact surface area and exposure time. Water flows evenly over the unit cross section before dropping into the media filled aeration zone. The media allows for the air to move up through the finely dispersed water droplets.

Volatile Organic Carbon (VOC) Removal

Volatile organic carbon (VOC) are regulated organic compounds that are either hazardous to breathe or flammable. Usually these chemicals are removed by means of activated carbon usually followed by air stripping. This method has been shown to remove 95%+ of these compounds.

Activated Carbon Units

For small flows, the system consists of three (3) activated carbon units followed by a forced draft aerator. The activated carbon units are run in series in order to obtain maximum effectiveness. Unit A begins as the lead unit with Unit B as the lag unit. To simplify the piping and reduce the number of valves, Unit C is always the polishing unit.

The units are 5' diameter by 72" bed depth and contain 3,000 lbs. of activated carbon. These units are designed to be regenerated offsite and should have a capacity of at least 30 days.

When Unit A exhausts, it is replaced by a freshly regenerated unit. At this time, Unit B becomes the lead unit and Unit A becomes the lag unit. In this way, the lag unit always has the greatest capacity. The units are piped and valved such that they can be isolated, removed, and the order of operation changed while the system is online. Unit C is always the polishing unit and should be changed every six months whether it needs it or not. This will prevent problems with bed compaction, biological growth, etc.

As stated above, the units are regenerated offsite. Spare units may be stored onsite for use when inline units become exhausted.

Forced Draft Aerators

After the removal of the majority of VOC's via the activated carbon, the stream is fed to a forced draft aerator for stripping of the last remnant of the VOC's. This minimizes the amount of VOC's discharged to the atmosphere. Following this step, the stream is discharged to the receiving waters.

If the concentration of VOC's is too high in the deaerator effluent air, activated carbon can be used again or the VOC's may be destroyed by several means, such as burning. One of the advantages of this system is that it would be a fairly straightforward task to pilot the treatment effectiveness.

For plants with a flare, all vapors are usually gathered and sent to the flare. Natural gas is added to the vent stream and then all organics are burned in the flare. This system removes >99.9% of all organics.