

Wastewater Installers

Oxidation Ponds

An oxidation pond is a shallow pond designed to treat sewage by the influence of air and sunlight. This pond will serve as a secondary treatment technique and must be preceded with a septic tank for primary treatment. The septic tank feeds partially treated effluent to the oxidation pond which uses prolonged retention time for biological interactions of microbial bacteria, air and sunlight to complete the digestion of harmful substances in the effluent.

Design

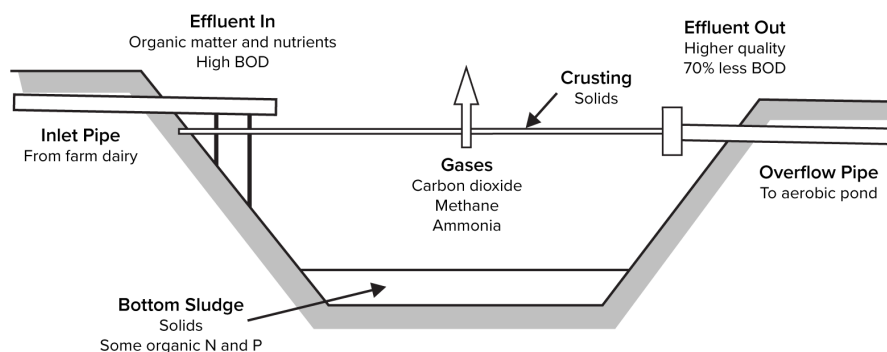
Oxidation ponds may be used when field lines cannot be utilized due to groundwater depth or insufficient soil drainage which is indicated by the soil percolation test. Ponds should be constructed with vertical side walls made of cypress, treated timbers or concrete blocks. These will be constructed to provide a permanent structure. Although not encouraged, a pond may be constructed with sloping sides and earthen levees. The slope of the natural earth side walls must not be shallower than one-to-one (45-degree angle). For the earthen levee design, more space is needed and routine maintenance including mowing levees is required.

Dimension Requirements

Oxidation ponds should be a minimum of 400 square feet (ft²) with an average depth of 4-5 feet. With an area of 400 ft², the pond would be sufficient for 400 gallons per day (GPD). If the wastewater effluent is higher in biological oxygen demand (BOD), the square footage of the pond should be increased to properly treat the system. At a depth of 4 feet, the pond should provide a 30-day retention time for effluent to be processed. This process replaces the conventional field lines and must be used in conjunction with a septic tank as the primary treatment method.



Residential oxidation pond for wastewater effluent.
Photo by Richard Grabert



Piping schematic for
an oxidation pond.

Specification for Piping

Pipes used for an oxidation pond must have a minimum diameter of 4 inches and a slope of 2 inches per 100 feet. The inlet to the pond should extend 4-6 feet horizontally into the pond in a downward direction. The outlet from the pond should extend 4-6 feet horizontally into the pond and have a tee with the invert set at the operating water level. One leg of the tee must be open and extended above the water level, while the down leg must extend 1.5-2 feet below the water level. The inlet and outlet must be as far apart as possible to limit short circulating and promote longer detention time. Regarding slope, the invert of the pond outlet must be below the invert of the pond inlet to ensure water will not back up in the septic system. Additionally, the invert of the pond inlet must be at least 2 inches lower than the invert of the septic tank outlet. This provides a gravity flow away from the residential home.

Additional Requirements and Procedures

- The ponds must be enclosed by a suitable non-climbable fence 5 feet in height to keep out children, pets and wildlife. A locked gate must also be used for added security. The fence must be well maintained and monitored for structural damage.
- Vegetation, especially trees, must be well maintained from around oxidation ponds. Mowing levees may increase the maintenance cost and upkeep of using a pond for secondary treatment. Note: The addition of any pesticides or chemical treatment for vegetation may inhibit the pond from adequately treating the wastewater effluent.
- Ponds that are abandoned or no longer in use must be dewatered and allowed to dry.

References

- <https://www.doa.la.gov/media/j3hnpfdy/51.pdf>
- <https://ldh.la.gov/assets/opw/Center-EH/sanitarian/onsitewastewater/7608.pdf>
- <https://ldh.la.gov/page/wastewater>

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