

WASTEWATER STABILIZATION PONDS (LAGOONS)

RANDOLPH COUNTY, MISSOURI

A wastewater stabilization pond can provide satisfactory sewage treatment in rural areas where soils are not suited for absorption systems. Single residence wastewater stabilization ponds are not generally suitable in subdivisions with lots less than three (3) acres in size. No more than one (1) single family residence will be allowed on one lagoon by the Health Department.

Minimum Separation Distances:

- 75' Property lines-more if needed to contain effluent on own property.
- 200' Existing Residence
- 100' Residence it serves
- 100' Potable water supply or pump suction line
- 50' stream, water course, lake or impoundment

Pond Utilization:

Ponds may be utilized when there are no significant limitations related to groundwater from their use and the soils have been demonstrated to be very slowly permeable. There shall be a minimum separation distance between the pond bottom and creviced bedrock of 3' or installation of a clay liner a minimum thickness of 1' or a synthetic liner, either of which must be acceptable to the administrative authority. Restrictive layers, such as fragipans shall be a minimum of 12" thick and shall not be breached during construction.

Steeply sloping areas should be avoided. A clear sweep of the surrounding area by prevailing winds is desirable. Heavy timber shall be removed for a distance of 50' from the water's edge to enhance wind action and prevent shading.

A septic tank before the lagoon can improve quality of the discharge from a lagoon, but is not mandatory unless the lagoon is constructed in a subdivision or on a property of 10 or less acres. The pond shall be designed on the basis of four hundred and forty square feet (440 sq. ft.) of water surface per bedroom at the 3' operating level. This may be reduced by 10% when using a septic or aeration tank. The minimum lagoon size shall be 900 sq. ft. The table below shows common sizes.

Bedrooms	Sq. Ft. required	Size Aeration/Septic	Sq. Ft./No Reduction	Sq. Ft. with Reduction	Size
2	900	500/1,000	30' X 30'	900	30' X 30'
3	1,320	500/1,000	37' X 38'	1,188	33' X 35'
4	1,760	750/1,250	40' X 44'	1,581	39' X 40'
5	2,200	750/1,500	45' X 48'	1,980	45' X 44'

6	2,640	750/1,500	50 X 53'	2,376	50' X 47'
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A single cell is generally acceptable for single residence pond systems. If multiple cells are used for further polishing or storing of the effluent, the secondary cell shall be one-half the size (½) of the primary cell.

Embankments:

- Minimum top width 4'
- Slopes-inner and outer 3:1 Maximum slope 4:1 Minimum slope
- Freeboard 18" Minimum
- Constructed of impervious materials (clay) and compacted sufficiently to form a stable structure.
- Erosion can be minimized by seeding embankments to 1' above water line, or use of Rip rap.

Structure:

- Influent line-sound, durable material SDR 35 or greater.
- Minimum diameter of 4"
- Minimum grade 1/8" per foot from point of entry into the pond
- Cleanout required near pond embankment.
- Elevation of cleanout bottom shall be a minimum of six inches (6") above the high water level in the pond.
- Pond shape shall be round, square, or rectangular. Rectangular ponds shall have a length not exceeding 3 times the width.
- Pond floors shall be stripped of vegetation & leveled.

Effluent:

- Effluent shall be withdrawn from 6" below the water surface. This can be done by placing a tee on the inlet end of the pipe or by placing the outlet pipe 8-10" lower on the inlet end than the outlet end of the pipe.
- Effluent from the pond **must** be disposed of on the property from which it originated.
- The minimum distance from the outlet to a property line is 100'. In some cases additional footage may be required to assure effluent doesn't cross property lines.

Fences: The lagoon must be fenced, and be capable of being mowed. The following requirements must be met.

1. The fence shall be at least four feet (4') in height.

2. The fence shall be welded, woven or chain link material with no smaller than fourteen gauge wire. Cattle or hog panels can be used with a tee post instead of a line post.
3. Fence posts must be pressure treated wood, galvanized or painted steel. Fence posts shall be driven, tamped or set in concrete. Line posts should be at least 18" deep and shall be spaced no more than 10' apart. Corner posts should be at least 24" deep and shall be properly braced.
4. **If desired, decorative fencing such as white heavy molded plastic, is acceptable so long as it is gated, and sturdy enough to keep animals and children out.**
5. The fence shall be no closer than the center of the berm to the water's edge at the 3' operating level, however it is recommended that the fence be placed around the outside perimeter for ease of mowing. Fence set-backs shall be no more than 30' from the waters edge.
6. The fence shall be of sound construction with no gaps or openings along the bottom.
7. A properly hinged 4' high gate or comparable materials shall be installed and provided with an effective latching device. The gate should be 36-48" in width to accommodate maintenance and mowing equipment.
8. It is required that the fence be completed prior to occupancy of the residence.
9. To screen the lagoon from sight, Thuja Green Giant evergreens grow quickly (3½'/year) and can be placed about 40' in front of the lagoon.

In some cases it may be necessary to introduce water into the lagoon to facilitate start-up of the biological processes and to prevent cattails from growing. This can be accomplished by pumping water from a pond or by temporary hook-up of roof drains, footing drains, or other sources of rainwater to the lagoon.

Odor problems: can be caused by fall and spring water turnover. This is a temporary and totally natural process. If it continues for more than a couple of days you may wish to treat the lagoon with two (2) lbs. of sodium or ammonium nitrate per day until the odor dissipates. Other causes for odor problems may be overloading, ice cover, atmospheric conditions, or organic materials such as leaves or weeds in the lagoon.

Lagoons are a very simple and natural way to break down wastes. If mowed and maintained properly they do not have to be an eyesore. With a little landscaping and creativity they can enhance your landscape.