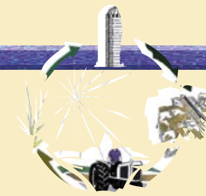

By Peter Wright

Shape up your storage

CAFO plans require manure pits to meet design standards. Here's what to do if yours doesn't

That old earthen manure pit has served you well for years. But its days may be numbered if the pit's design doesn't meet Natural Resource Conservation Service (NRCS) standards. Concentrated Animal Feeding Operation (CAFO) permits require agricultural waste plans that adhere to these standards which include manure storages.

If your earthen manure storage wasn't designed, have NRCS, where available, or a professional engineer evaluate it to see if the storage meets the standards.

A professional assessment should:

1. Evaluate the watershed and specific site. This helps determine any potential environmental risks of a pit. The evaluation should include information on well depths and locations, aquifers, bedrock location and condition, surface water sources, and flow patterns. Information on area soils, manure pits and ponds adds detail that may be important if seepage from your manure storage pond is suspected.
2. Gather design and construction data. Answer the following questions about your manure pit: When was it built? Who built it? What equipment and methods were used? Were unusual conditions or soils encountered? What is its history of use? What are the pit's dimensions: size, depth, volume and top width. Is that width adequate? Are the side slopes stable or do they show signs of sliding, cracking or poor maintenance?
3. Evaluate the groundwater. Data from the nearest wells can offer important information on nitrate levels and bacteria counts in well water. Is there other evidence that a manure storage pond is leaking?
4. Dig test pits. If you can empty your manure storage and gain access to the pond's bottom, dig test pits to determine existing soil lining. Perform grain size distribution, Atterberg limits and permeability tests on the samples. Also perform a similar evaluation of the dike. Dig test pits properly and backfill them correctly to prevent causing leaks. Test pits can also be dug uphill and downhill outside the manure pond to check for manure and water seepage and to analyze existing soil. Site conditions will determine how many test pits to dig, where to dig them and how deep they should be.

An action plan. The results of this professional evaluation dictate your options. If the site is environmentally sensitive and the soils are marginal, set up a monitoring system to check for future seepage. This may be nothing more than shallow wells, sampled regularly.

To avoid installing and monitoring wells, tools such as the electromagnetic terrain conductivity survey can map areas of higher nutrients leaving a manure storage facility.

A second option: Reline a manure storage pond if your evaluation shows a problem exists or there is the potential for a problem on a sensitive site where risks must be reduced. There are two linings to consider: An earthen lining with suitable soils placed according to engineering specifications and a plastic lining, designed for the site, with proper drainage and venting.

Your final option: Close down the manure storage pond. If there is no feasible way to prevent the storage pond from being a potential pollution problem, empty it and fill it in or breach the dike to prevent safety or environmental hazards. In-ground manure storage ponds can be converted to water ponds. ◊

Take a whiff from page 31

-$390.27. The sale of solids is assumed to generate $6,000 per year. Valuing nutrients at 25 cents per pound, remaining nutrients are worth $3,354 per year.

These figures will vary depending upon whether all nutrients, or only nitrogen, are needed for crop production and if the sale of solids continues.

Annual expenses for the treatment lagoon system include $2,995 for electricity to run the pump and $3,360 to remove the solids from the settling ponds. The pump was assigned a 10-year life. Spreading costs and off-site storage were not computed. (See Table 2.)

Excluding the nutrient value, the system has a negative present value of -$584 per cow over its 20-year life. When the system's costs are spread over 300 cows, which the farm can accommodate, the negative present value drops to -$125 per cow over 20 years, or a negative $6 per cow per year.

A suitable system. Both the lagoon treatment and the anaerobic digester are feasible systems. They provide excellent odor control, and their management is within the scope of most dairies. Nutrient use and by-product sales are important to reduce their costs.

Each has advantages and disadvantages. The lagoon treatment system works well with a flushing system to clean freestall barns. Gently sloping topography and relatively impermeable soils lower initial costs.

Farms that don't need all the nutrients in the raw manure may benefit from the nutrient losses of this system. But weather's effects on the Bion process vary the nutrient concentrations and may make it more difficult to develop a nutrient management plan for this system.

The anaerobic digester system is best for a farm that has high electric costs and can use the nutrients for crop production.

Irrigating effluent on growing crops without excessive odors increases the likelihood that nutrients can be used. But farms that have high to excessive levels of phosphorus and potassium must evaluate nutrient use on cropland. ◊