

lagoons that are covered or sited and designed to achieve total containment.

EPA recognizes that CAFOs may use different technologies to meet the zero discharge standard and that these technologies may have slightly different vulnerabilities to extreme weather events. Therefore, EPA is clarifying in today's rule that a CAFO may meet the zero discharge standard by designing, constructing, operating, and maintaining its waste management and storage facilities to contain all manure, litter, and process wastewater including the direct precipitation and runoff from a 100-year, 24-hour rainfall event.

By definition, a 100-year, 24-hour storm is an event which occurs on average once every 100 years. EPA believes that the 100-year, 24-hour rainfall event criteria provides the protection of the resource that the Agency intended under the zero discharge limitation, while providing clarity for the regulated community. The principle of tying regulatory or program requirements to precipitation-related events that happen with a frequency of once every 100 years is also used in other federal programs. For example, the Federal Emergency Management Agency uses the 100-year flood as the standard for floodplain management and to determine the need for flood insurance in the National Flood Insurance Program. The USDA Natural Resources Conservation Service (NRCS) uses the 100-year design criteria for flood protection structures. For instance, if the potential failure of a water control structure is likely to cause loss of life or extensive high value crop or property damage, NRCS uses the 100-year frequency storm as the basis for design.

CAFOs may choose to meet the zero discharge requirement through any technology designed to achieve this threshold. If a facility is designed, constructed, operated, and maintained to meet the 100-year, 24-hour rainfall criterion, and it nonetheless has a discharge due to extreme weather, this would not be considered a violation of its permit conditions. This provision is separate from an upset defense discussed above.

EPA has carefully evaluated the concerns raised in comments regarding the technical feasibility of total containment at swine, poultry, and veal operations. The concerns raised by commenters are primarily associated with operational factors and the effect of climate on the use of lagoon covers. Although the effluent guideline does not require the use of any specific technology, EPA concludes that the total containment requirements of this rule could be met at new sources through the

use of lagoon covers or other appropriate technologies. New sources will avoid the design challenges and retrofit costs that existing sources would face with the use of lagoon covers, should they choose that technology to comply. Based on the information in the record, and as discussed above in this section, EPA has received data to demonstrate that each of these factors has been successfully handled at CAFOs and other facilities. Furthermore, by retaining all manure, litter, and other process wastewaters within the building (for example, by using underhouse pits) and not using an outdoor liquid impoundment, or by using other appropriate technologies, such as a lagoon designed to contain the precipitation and runoff from a 100-year, 24-hour rainfall event, new sources can avoid the operational challenges posed by covers.

In many instances, CAFOs are expected to construct swine and poultry housing that maintains the manure in dry form and stores the dry manure under cover until it is hauled off-site or land applied. Dry manures are generally more marketable and easier to transport, important considerations for facilities with insufficient land for agronomic use of the manures. The majority of poultry operations use total confinement housing practices, generating a dry manure that is collected within the poultry houses. The manure/litter is removed periodically from the poultry houses and is either taken directly to the land application area, transported to off-site fields or centralized processing facilities (e.g., pelletizing operations), stored on-site within a roofed facility, or stored in temporary field stacks which can be covered and configured to prevent contact with precipitation. There has also been a great deal of interest in dry manure systems for swine operations in recent years, as evidenced by the current use of hoop structures and other designs described in the Technical Development Document. Dry manure systems are widely used at swine operations in Europe and are also being used at some operations in Canada. Some operations in the U.S. already use dry manure systems and EPA expects that the U.S. swine industry will choose to construct dry manure systems at new operations with greater frequency as they gain greater experience with these designs.

In other instances, new swine operations will likely choose underhouse deep pit systems to comply. Contrary to standard practice 30 years ago, closed buildings with underhouse deep pits are currently the predominant production technology used at swine

operations. By 1995, approximately half of all large swine operations were using under floor pits with slotted floors. In 2000, more than 2,200 large swine operations nationwide utilized under floor pits, with several hundred additional operations using slurry storage. EPA has learned through site visits, as supported by meetings with the National Pork Producers Council (a trade association) that, because of further technological advancements, newly constructed systems rarely include lagoons, and that closed buildings with under floor pits are now the predominant production technology. Given the widespread use of this design, EPA anticipates that a number of new operations constructed in the next five to ten years will choose to use deep pit systems.

Some new swine operations may choose to use lagoon-based or other wet systems, depending on the factors specific to their situation. For example, some new operations may choose to rely on covered lagoon systems (with gas flaring or energy recovery). Another alternative technology that may be selected would be to install an anaerobic digester followed by a covered lagoon for storing the digester effluent. Benefits to operators using anaerobic digesters include the cost savings (or even revenue, in some cases) from electricity generation, a better-stabilized waste, significant odor reduction, and improved marketability of the digester solids. During site visits conducted during the rulemaking EPA has observed the use of aboveground fiberglass-lined steel tanks to store swine wastes. When configured to exclude direct precipitation or to contain all direct precipitation and runoff from a 100-year, 24-hour rainfall event, these tanks are able to meet the zero discharge requirement. As noted below in section IV.C.2.e, in order to provide appropriate flexibility to CAFOs, alternative technologies that achieve overall environmental performance across all media equal or superior to the reductions that would be achieved under the zero discharge standard may also be authorized by the Director.

EPA is aware of some interest by the swine industry in achieving total containment by using uncovered lagoons that would not be expected to discharge to surface waters based upon siting and lagoon design. For example, by providing additional freeboard in the design, a facility with sufficient containment to retain all manure, litter, and process wastewater plus the direct precipitation and runoff from a 100-year, 24-hour rainfall event would