

## Meyers, Leasue

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**From:** Cary Sayre <carysayre@allstateconsultants.net>  
**Sent:** Friday, September 18, 2015 1:26 PM  
**To:** Meyers, Leasue  
**Cc:** LePage, Cindy  
**Subject:** MDNR - regulations - lagoons and land application

Thank you for the opportunity to comment on the draft regulations. Hopefully, I have the most current revision dated August 15, 2015. I may have mis-interpreted some of the information, so please call me if you have any questions or if you believe I mis-interpreted something. The following comments are offered for consideration:

1. The table of contents needs to be revised.
2. Page 6. (5) Basis of Design. F. diffuser arrangement. Maximum aeration at the influent may be necessary if only trying to remove ammonia. In some cases, a selector/anoxic type area for P or N removal may be designed in a basin. Aeration would only be used for mixing in the anoxic basin.
3. Page 7. (C) Area loadings for Land Application. 5. "easily accessible during routine operations". Should this be restated to reflect "easily read from the bank during routine operations"? Easily accessible may infer that the staff gauge should be easily touched by the operator during routine operations, but the gauges are many times in the water.
4. Page 7. (D) 5. A. Mixing. Consider these thoughts for rewording if considering an earthen cell. Installing, constructing and maintaining mixing, corner fillets and other types of items in earthen basins may be impractical. Earthen basins have maybe a 3:1 sideslope and aeration equipment should not be located so close to the bottom of an earthen cell to promote erosion of the soil due to turbulence. This could damage the liner.
5. Page 8. (6) Lagoon Construction Details. A 5 acre cell is not really that large. Consider increasing this area.
6. Page 9. 1. 2. A. is there a definition for a industrial contribution of concern?
7. Page 9. 1.2. D. this shows 1/16-inch per day. 3. Design. A. 5. this shows  $1 \times 10^{-7}$ . Are these two in conflict?
8. Page 10. 4. B. Liner panels state 4-6-inch overlap is required. This may be better as a general guide and also state "or according to manufacturer's recommendations."
9. Page 11. Influent Lines. Cast and DIP are the only pipe type listed. C900, C905, and restrained joint PVC may also be good solutions and may have advantages in some cases over iron pipe.
10. Page 12. (E). Control Structures and Interconnecting Piping. 2. Piping. PVC may also be a good option in some cases.
11. Page 12. (E). 2. A. Drawdown Structure Piping. 1 foot increments may not be necessary on deeper basins. For example, if a basin is over 7 feet deep, 2 foot increments may be adequate.
12. Page 13. (7) Lagoon Retrofits. (B). Covers. This section seems to limit a cover to only HDPE. Something besides HDPE may be a quality product. Consider wording that would allow other materials to be used as a cover.

13. Page 13. (7) Lagoon Retrofits. (B). Covers. 1. B. This section seems to limit the cover being secured with an anchor trench. Consider adding to the anchoring system the words “or according to manufacturer’s recommendations”.
14. Page 14. (7) Lagoon Retrofits. (B). Covers. 1. B. 3. Gas collection piping is limited to HDPE. There may be other types of material such as Stainless steel that would be adequate. Please consider changing the wording to allow other types of pipe.
15. Page 14. (8). 1. Location. The word “exact” is not be practical as a boundary survey is one surveyor’s opinion based upon the known information and interpretation of that information. I might suggest deleting the word “exact”.
16. Page 14. (8). 7. Evaluation of Wastewater. Please confirm that this is a one time sample and test.
17. Page 15. 8. C. Slopes. This paragraph appears to be contradictory. There has been success in the with slopes up to 12% on pasture and forested area, and up to 15% may be acceptable in some instances. Please consider changing the wording.
18. Page 15. (9) Sources used for “any” information may be difficult. Suggest eliminating the word “any”.
19. Page 15. (9). (A). 6. Predicting future land in some cases is impossible. Please consider revising to include language that states “known or expected future land uses” could be provided.
20. Page 16. (B). 2. The words “excluding roads or highways” is confusing. Does this mean that sprinklers could be installed within 150 feet of a property line as long as it is along side a roadway. For example, sprinklers could installed 50 feet inside a property line if the road right-a-way is adjacent to the property line?
21. Page 16. (C). 3. Soil Permeability. Soils with less than 0.2-inches per hour may be common in some parts of the glacial til areas including those of North Missouri Green Hills Region. These areas have a few inches to a few feet of top soil then the clay layers begin and continue for several feet. Grass still grows on these soil conditions and it makes good pasture and I believe typical irrigation equipment can be utilized. Special irrigation equipment may not be necessary, but irrigation rates will need to match the plant and soil transpiration and adsorption rates.
22. Page 17. (E). I believe Equipment should be 2. Instead of 3.
23. Page 17. (E). 4. Slope. This is contradictory to item 17 above.
24. Page 17. (E). 1. A. Design hydraulic loading rates should be reflective of item 21 above.
25. Page 17. (E). 3. Equipment. A. Irrigation equipment may consist of big guns, travelling guns, and solid set sprinklers that spray water into the air in a circumference. Please clarify the requirement “ Any spray application equipment specified shall minimize the formation of aerosols”. The department may wish to contact irrigation equipment companies to determine if there is better wording for the intended statement.
26. Page 17. (E). 5. A. hourly application rate. Slopes and rates need to correspond to previous statements.
27. Page 21. (12). (B). Recommend adding that the design shall also comply with the manufacturer’s recommendations.
28. Page 22. (F). Orifice and Orifice Shielding. The equation and design should also correspond to manufacturer’s recommendations.

29. Page 25. (E). Lines and Trenches. 1. Drip lines design should also follow the soil morphology report and the manufacturer recommendations.
30. Page 25. (F). 1. Does this suggest that the drip field lines need an inspection port? These lines (maybe 3/4-inch diameter) are typically knifed into native soil so an inspection port into the drip line or field may not be practical.

Thank you.

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