

These exercises are intended to support your self-directed learning. Answer the questions based on the SPM Version 3 standards and guidelines for determination of hydraulic and linear loading rates and the limited information provided within each question. Assume that there are no further site/soil constraints or other unusual circumstances that affect loading rate selections. Then check the answer key - which includes some helpful SPM references and notes.

1. What is the maximum allowable Type 1 HLR for loam texture, blocky structure shape, moderate grade, moderately hard dry consistence?
2. What is the maximum allowable Type 1 LLR for loam texture, blocky structure shape, moderate grade, moderately hard dry consistence ... slope is 7%, depth of suitable soil is 95 cm?
3. For conditions listed in #1 and #2 above, what is the minimum area of infiltrative surface for a system with 1500 L DDF?
4. For conditions listed in question #1 and #2 above, what is the minimum system length for a system with 1500 L DDF?
5. What is the maximum allowable Type 1 HLR for soil with fine sand texture, and with depth of that soil horizon extending to at least 30 cm below the infiltrative surface, single grain structure shape, loose consistence, and permeability of 2200 mm/day Kfs?
6. What is the maximum allowable Type 1 LLR for fine sand texture, single grain structure shape, loose consistence, slope is 2%, depth of suitable soil is 65 cm, and percolation rate is 4 minutes per inch?
7. For conditions listed in question #5 and #6 above, what is the minimum area of infiltrative surface for a system with 1300 L DDF?
8. For conditions listed in question #5 and #6 above, what is the minimum system length for a system with 1300 L DDF?

9. Fill in the blanks below to determine the minimum dimensions of a bed dispersal system given the following information:
- VS is easily met due to significant depth of suitable soil.
 - Soil texture to 50 cm depth below the infiltrative surface is loam.
 - The loam horizon has weak grade, blocky structure with moderately hard dry consistence.
 - The average percolation rate is 28 minutes per inch.
 - DDF is 1300 L/day, with type 2 effluent.
 - The slope within the dispersal area and the downslope receiving area is 7%.

(Fill in the blanks) The structure and consistence category is _____ and ...

the maximum allowable HLR based on soil type is _____ ...

the maximum allowable HLR based on percolation rate is _____ ...

therefore, the applicable HLR is _____ ...

and the min. AIS is _____.

The maximum allowable LLR based on soil type is _____ ...

the maximum allowable LLR based on percolation rate is _____ ...

therefore, the applicable LLR is _____ ...

and the minimum system contour length is _____.

The minimum dimensions of a dispersal bed are _____ long and _____ wide.

10. Fill in the blanks below to determine the minimum dimensions of a bed dispersal system on a raised sand mound given the following information:

- The proposed sand media meets the ASTM C33 specifications but there is 6% passing the No. 100 sieve and 2% passing the No. 200 sieve.
- Assume VS standards are met.
- Soil texture to 30 cm depth below the original grade is loam. Underlying soil is seasonally wet.
- The loam horizon has weak grade, blocky structure with friable moist consistence.
- The average percolation rate is 18 minutes per inch.
- DDF is 1300 L/day, with type 1 effluent.
- The slope within the dispersal area and the downslope receiving area is 7%.

The structure and consistence category of the underlying soil is _____ and ...

the maximum allowable basal HLR based on soil type is _____ ...

the maximum allowable basal HLR based on percolation rate is _____ ...

therefore, the applicable basal HLR is _____ ...

and the min. basal area is _____.

The maximum allowable LLR based on soil type is _____ ...

the maximum allowable LLR based on percolation rate is _____ ...

therefore, the applicable LLR is _____ ...

and the minimum system contour length is _____.

The maximum allowable sand media HLR is _____ ...

and the minimum AIS is _____ ...

the minimum dimensions of a dispersal bed are _____ long and _____ wide which

meets / does not meet (select one) the basal loading check.