6.3 LAGOONS

This section discusses the purpose and need ~~of~~ for wastewater storage structures at wastewater ~~land treatment~~ reuse facilities, design requirements, and seepage testing protocol.

6.3.1 Lagoons: Purpose and Need

Storage of wastewater is needed for some land ~~application~~ treatment systems and other reuse systems. Wastewater generation and treatment plants can typically have one to several lagoons serving various purposes. The storage volume can vary from as little as one day's flow to as much as six months. Storage is needed when precipitation produces an excessive hydraulic load on the soil crop system; when cultivating practices prevent application; when winter weather conditions preclude operation; when flow variations in quantity and quality requires equalization; when winter weather forces a reduction in the rate of application; and as a backup for the treatment system under emergency situations. It is possible to reduce or remove storage requirements by providing alternative backup measures to be determined on a case-by-case basis.

The key elements to consider when determining storage requirements are the local climate, potential for odors, and the period of operation. Storage is generally needed during the harsh winter months when application rates must be reduced. Evaluation of these elements helps to determine the needed storage volume. Analysis of rainfall data also helps identify the storage needs related to expected periods of excessive precipitation. Some storage may be necessary to retain certain storm events on the land treatment site to prevent runoff. See LINK to review guidance relating to storm events and runoff. Stormwater containment will be subject to stormwater rules, however, it is not subject to design and seepage criteria for wastewater lagoons.

In some areas, and depending on wastewater characteristics, the winter weather may be mild enough to allow application during much of the winter. In these cases, consideration must be given to the trade-off of the cost of storage versus the cost of additional area for land application. See Section 4.1 for additional information on non-growing season application and storage practices. See also Section 6.8.1 for information on weed control around lagoons.

It is important for lagoons to be sufficiently sealed so that they do not become major contributors to the contamination of ground water. For this reason, members of the regulated community are required to demonstrate the integrity of their wastewater treatment and storage structures. The following provides guidance for methods to determine ~~ing~~ seepage rates for lagoons - LINK. Alternative methods may be submitted for review and approval DEQ.

6.3.2 Lagoons: Design Criteria

Design criteria for municipal and industrial lagoons are based on Ten State Standards otherwise known as the "Recommended Standards for ~~Sewage Works~~ Wastewater Facilities – 2004" by the Wastewater Committee of the Great Lakes-Upper Mississippi River Board of State ~~Sanitary Engineers~~ and Provincial Public Health and Environmental Managers pursuant to the Idaho Water Quality Standards (IDAPA 58.01.02.402). These design criteria for lagoons require lagoons be designed with a seal that has a seepage rate less than 500 gallons/acre-day (0.018 inches/day).

Performance criteria based on DEQ policy currently ~~presently~~ recommends lagoons be allowed to seep at a rate up to 3400 gallons/acre-day (0.125 inches/day), or approximately seven times the design criteria. This rate is based on a perceived allowable error in physically measuring the seepage rate.

DEQ typically recommends that recent seepage data be submitted as part of the permit renewal application package each five years. Results of the seepage data will determine any permit conditions needed to update or modify existing lagoons.

If a properly tested lagoon leaks more than this 0.125 inches per day, the options for mitigation include 1) retesting the seepage rate immediately; 2) repair or replace or install liner and retest; or 3) develop a plan based on ground water sampling and analyses to determine the effect of the leakage on the local groundwater. If that impact does not comply with the Ground Water Quality Rule, then options 1 or 2 above remain.