Pumping to a Drying Bed

Pumping manure slurry to a shallow holding cell or drying bed has become an option for Beef Packers, Feedlots and Dairies. Especially those that don't have enough agriculture ground close to the site to apply the manure slurry at agronomical rates. This option is only viable if the evaporation rate exceeds annual rainfall by at least 8" per year.

To find out your areas evaporation vs annual rainfall you can search the web for this information. The formula for determining the viability of the project is:

Annual Rainfall < Evaporation + Runoff + Deep Drainage ***(leaching)***

Obviously runoff and leaching is not a permissible option; so this boils down to the simple question, is there sufficient evaporation to warrant the cost of creating and using a drying bed in your area. The more arid the climate the more viable this type of option becomes.

There are several factors that determine the amount of evaporation that will occur. These factors are: 1) surface area of drying bed, 2) depth of slurry or water, 3) air temperature, 4) slurry, soil or water temperature, 5) turn over or mixing of slurry, and 6) wind.

Before a producer considers this option they should consult with their area water board or EPA or state regulatory authority. LPD will pump to a drying bed or holding cell but it is at the request of the producer and done at the producers own risk of liability. This request must be in writing and contain specific language in which the producer acknowledges the risk and liability of pumping manure slurry to the drying beds.

It is recommended that a drying bed be limited to 2 to 3 feet of slurry that is pumped as thick as possible. The black or dark color of manure slurry will attract the sun rays and warm up the liquid which will facilitate the drying process. As the slurry dries it reticulates or creates fissures or cracks in the surface. At this point the evaporation has to happen through these fissures or the wicking action of the moisture toward drier material.

Once the slurry has sufficiently dried so there is no danger of runoff then the manure slurry can be windrowed and frequently turned so the air can dry it down to the desired consistency. Once dried, the resulting composted manure can be sold, transported and applied to farmers fields around the area.

It is best to work with your local trucking firms or dry manure haulers to facilitate the sale and application of the product. They are usually very familiar with the farmers who

traditionally buy dry manure and compost. If you have any organic farmers they will be willing to pay a premium for the product.

When considering the cost, one should consider all aspects of the project: building the drying beds; pumping to the drying bed; windrowing and composting the manure in the drying beds; removal, hauling and disposition of the manure; and the reclamation of the land when done.

Preparation of the Drying Beds

A drying bed is a flat parcel of ground that has tight soil so the effluent or manure slurry will be contained and not leach down into the ground water. This could be a low area in a field or a playa lakebed where the water has no chance of reaching public waterways. Or it could be an area of land in which an earthen berm has been created to contain the manure slurry as it dries.

A drying bed should be built with 3 to 3-½ foot berms around the edge. These berms *must be packed tight* so there is no chance of the hydraulic pressure of the water breaching or flowing through the earthen berms. A producer can hire a surveyor or they can use a transit and rod to find areas of level terrain.

It is better to build smaller cells that are very level than a larger one that has a slope to one side. Water will seek the lowest level so land that is not level will not be able to hold the amount of slurry that a person would hope.

Some producers have used front end loaders and dump trucks to find and stack soil around the perimeter of the drying bed. Others have used road graders, dozers, scrapers and other earth moving equipment to move the top soil from the cells to make the berms for these holding cells.

If the soil is not as tight as desired and there is some concern about the amount of water leaching down; some have used heavy duty silage pile plastic to minimize the issue.

Reclamation of the Land when Project is Complete

If there is a need to use these drying beds in the future the berms can be left intact. The drying beds then can be used on a periodic basis as the need to clean out a lagoon is required. Weeds and grass will eventually grow on these berms so it is nice if they are created with a gradual slope so they can be easily mowed.

If the use of the drying beds is only once in a very long while then the drying beds need to reclaimed and brought back into useable land again. This will require the earthen berms be leveled or put back where the soil was taken from. This can be done with front-end loaders, graders or other earth moving equipment.

If the berms were made from the top soil of the drying bed area then this same soil can be graded back to its original place when the project is finished. Any remaining manure residue creates great fertility for any crops which will later be grown on the land.