Minnesota Pollution Control Agency

Water Quality

Wastewater Technical Review and Guidance

SLUDGE DRYING BEDS – REVIEW CHECKLIST

Water/Wastewater/#5.74, May 2001

FACILITY NAME | DATE

CONSULTING ENGINEER | SITE INSPECTION (DATE & INSPECTOR)

PLANNING OR DESIGN PHASE

PSRP REQUIREMENTS

Meet PSRP?

- 9" or less layer of liquid sludge
- Drain/dry on beds for minimum 3 months.
- Daily air temperature must be above 0˚C (32˚F) for two of three months.

VECTOR ATTRACTION REDUCTION

The sludge must also meet the requirements of 503.33 from the sludge regulations which requires the mass of volatile solids be reduced by a minimum of 38 percent.

DESIGN RECOMMENDATIONS

- Minimum of two beds.
- 2 ft^2 /capita percolation beds.
- 2.5 ft^2 /capita paved beds with center drainage strip.
- Feed pipe minimum 17" above surface.
- Feed pipe velocity 2.5 ft/s minimum.
- Feed pipe normally cast iron.
- Distribution boxes necessary to divert the sludge to the different beds.
- Provisions for flushing the lines necessary (to prevent freezing)
- Splash plates placed in front of sludge outlets (to spread sludge over bed and prevent sand erosion).

wq-wwtp5-74

UNIT SIZING

- 8" maximum depth of wet sludge. _____

The total bed area calculation should consider:
Volume of wet sludge;
Depth of wet sludge drawn to beds (8" max. recommended);

Total digester volume and other wet sludge storage facilities;
Degree of sludge thickening provided after digestion;
Maximum drawing depth of sludge which can be removed from the digester or other sludge storage facility without causing process or structural problems;
Time required on the bed to produce a removable cake; and
Capacities of auxiliary dewatering facilities.

GRAVEL

- 12" total in depth. _____
- Extends 6" above top of underdrains. _____
- Placement in 2 or more layers. _____
- Top 3" of gravel particles 1/8" – ¼". _____
- Properly graded for level surface. _____

SAND

- 6-9" total depth above underdrains
  (Some sand will be lost during cleaning;
  if sand layers is too deep it retards drainage). _____
- Clean, washed, coarse sand. _____
- 0.8-1.5 mm particle size. _____
- Properly graded for level surface _____

UNDERDRAINS

- 4" diameter minimum. _____
- Laid with open joints. _____
- Maximum spacing 20'. _____
- Use material of suitable strength and _____
- Use corrosion-resistant material _____
- Underdrains adequately supported (gravel). _____

_____

ADDITIONAL DEWATERING PROVISIONS

Consideration shall be given for providing a means of decanting supernatant off sludge placed on the beds. More effective decanting of supernatant may be accomplished with polymer treatment of sludge (use chemical addition review checklist). _____

WALLS

- Water Tight _____
- Extend 18" above bed surface. _____
- Extend 6" minimum below bed surface. _____

SLUDGE REMOVAL

- Readily accessible to mechanical cleaning equipment. _____
- Concrete runways to accommodate cleaning equipment. _____
- Access to sidewalls. _____
- Entrance ramps down to the level of the sand bed. _____
- Entrance ramps high enough to eliminate the need for an entrance end wall. _____

* If an aerobic process is used, a large amount of sludge is generated and consideration should be given to using a combination of dewatering systems or other means of ultimate sludge disposal.

ADDITIONAL QUESTIONS TO CONSIDER:

a. What is the point of discharge for the underdrain system? _____

b. Is chemical addition being used? If so, what type of chemical? _____

c. What is the method of dewatered sludge removal (manual shoveling into wheelbarrow, truck, scraper, front-end loader, etc.)? _____

d. What is the method of ultimate disposal (landfill, land application, etc.)? _____

e. Is winter operation proposed? If so, will the beds be covered? With what? _____

f. Concrete foundation walls are normally required if the beds are to be covered. Covering is necessary if sludge is to be dewatered year-round. _____