

## WASH PLANT SETTLING POND GUIDELINE

A wash plant settling pond system must be designed to allow settlement of target particle sizes during the time of impoundment. Operators can avoid the need for discharge permits and additional water treatment by installing a closed water system. After initial construction, some modifications in operations or system design may be needed. A clarifier system is a less common, more expensive, water treatment option. See the attached “Wash Plant Schematic with Settling Ponds”.

**POND GEOMETRY** - Constructing two or more ponds in series should result in more effective sediment removal. Design the pond system to minimize short-circuiting and dead storage areas. Long, narrow ponds are best. A length-to-width ratio of 4:1 is recommended. If a pond’s length to width ratio is less than 4:1, use baffles to increase the flow path between the inlet and outlet. Inspect baffles frequently to maintain their effectiveness. Make the pond bottom level to facilitate sedimentation.

**POOL DEPTH** - A pond depth of 3 to 6 feet is recommended. Avoid depths less than 2 feet and more than 8 feet. Design ponds so that sediment can be cleaned out easily to maintain storage capacity.

**POOL VOLUME** - Under ideal conditions, particles down to fine silt size will settle out of 6 feet of water in about 6.5 hours. Design the system to hold at least 110 percent of the water volume used in 6.5 hours.

**SLOPES AND EMBANKMENTS** - Make interior pond slopes 3:1 or flatter. Make exterior embankment slopes 2:1 or flatter. Leave at least 1 foot of freeboard between the maximum pool elevation and the top of the embankment. Build embankments to acceptable construction standards, such as those developed by the U.S. Natural Resources Conservation Service (NRCS). Large embankments may need to be approved by the Montana Department of Natural Resources and Conservation (DNRC).

**INLET, WATER PASSAGE, AND OUTLET** - Locate the inlet and outlet of each pond as far apart as possible. If these features cannot be at opposite ends of a pond, use baffles to direct water in a longer path from inlet to outlet. If warranted, install an energy dissipater to spread out the flow and reduce the velocity of incoming water. If able, locate the inlet so that it discharges at or below the maximum elevation of the pool. Design and build inlets, water passages, and outlets to minimize erosion.

**LINER**- Install a liner during construction or install one later if the system loses too much water.

**SAFETY**- Provide appropriate safety precautions, including warning signs and fencing.

