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CONTRIBUTING EDITOR

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Low-cost sand and gravel separator

Many wells supplying sprinkler systems produce sand and small gravel in varying amounts and sizes. Sand and gravel particles lodge in the sprinkler nozzles and plug them. Anyone with such a well knows that continually unplugging nozzles can be exasperating. Also, plugged nozzles affect water distribution and sand in the water increases nozzle wear.

Raymond Humpherys and his son, Jerry, who sprinkle irrigate their dairy farm in Star Valley, Wyoming, experienced this problem. They pump about 1200 gpm from a well to supply water for wheel move sprinkler laterals. Until two years ago, they spent considerable time digging lodged sand particles from plugged nozzles. No sooner were the nozzles unplugged than they would start plugging again.

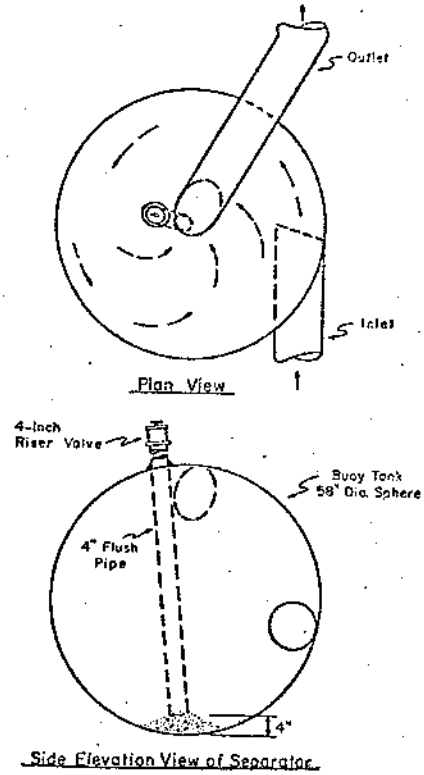
To solve the problem, they purchased a 58-inch diameter, 442 gallon buoy tank from a military surplus disposal yard for less than $100. They connected the buoy to the buried pipeline from their pump as shown in the drawing. The 10-inch inlet pipe was welded into the tank just below mid-height and close to one side. The outlet pipe was welded into the tank near the top. Water flowing through system creates circulation within the tank. The circular motion causes a centrifugal force which moves the heavier particles to the outside where the water velocity is lower. The particles then settle to the bottom and accumulate in the center. The action is similar to stirring a glass of water and sand. When the stirring stops, the sand settles to the bottom and collects in a small pile in the center of the glass. Several commercial separators are made for this purpose using the same principle.

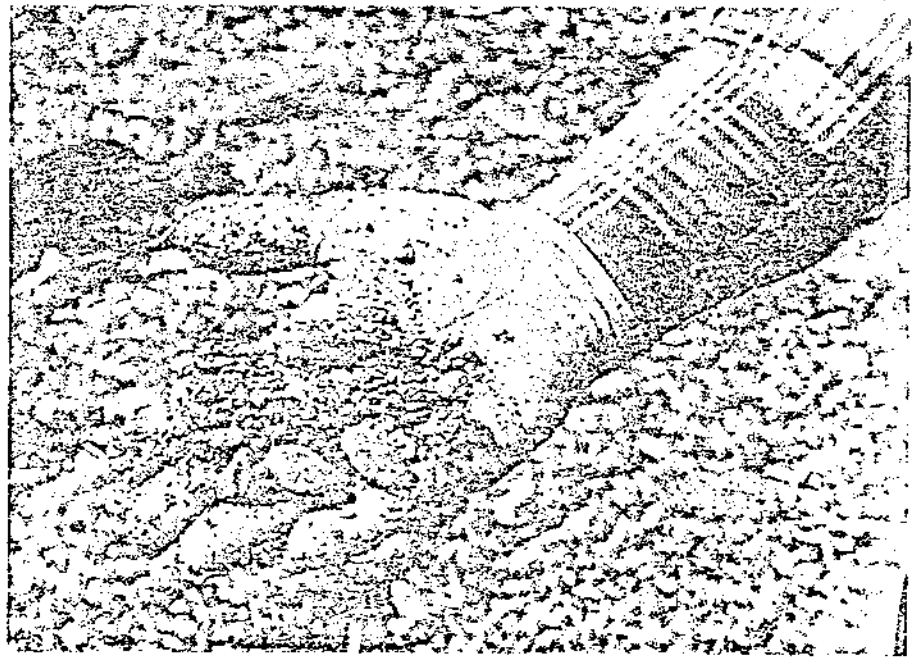
The buoy tank is periodically flushed to remove accumulated sand and gravel by attaching a length of sprinkler pipe to the riser valve on the flush pipe. The valve is then opened while the pump is operating. A sample of material flushed from the tank is shown in the first photo. The separator has completely eliminated the nozzle plugging problem and at a lower cost than most alternative means.

The buoys were originally painted for service in the sea and many of them can be used as they are, except for painting around the welds, while others may require further painting for protection. Some buoys have been coated on the inside with asphalt. This type should probably be avoided because the asphalt may erode and the dislodged particles could plug the sprinkler nozzles.

The present cost of these buoy tanks at the surplus disposal yard in Ogden, Utah is $125. Other suitable cylindrical tanks may be available in some areas at a nominal cost. The head loss through the tank is small and in most cases can be neglected. The tank can be buried as shown in the second photo so that it is out of sight, and except for periodic flushing, out of mind also.

It is normal for new wells to produce some sand. However, if excessive sand pumping continues, the water bearing formation may cave in and damage the well. Sand and gravel in the water also causes excessive pump wear. Remedial action such as gravel packing may be needed.





A sample of the material flushed from the tank.