

With the stringent discharge requirements and the need to minimize sludge, many waste treatment systems will need to be updated. Serfilco offers many items to help meet these standards for either small batch treatment or continuous systems. The chemistry, and therefore the instrumentation, for these systems are similar, be it simple pH adjustment and flocculation for cleaners or two-step cyanide destruct and chrome reduction systems.

BATCH TREATMENT SYSTEM

Batch treatment can often be accomplished in one tank with a pH controller and recorder along with an ORP (Oxidation Reduction Potential) controller. Polyelectrolyte can be added at the end of the cycle prior to effluent discharge through the Automatic Gravity Filter. A variation of this approach is to use a cone bottomed tank for draining of the sludge at a slower rate from the bottom discharge as required and to compact the bulk of the settled solids with a Filter Press. Other products Serfilco can supply for Waste Treatment applications include pH, ORP and flow control meters or monitors; mixers; metering, transfer or sump type pumps, as well as cartridge and bag type filters or carbon for additional purification.

CONTINUOUS PROCESS WASTE SYSTEMS

Waste cyanide and chrome streams are segregated and treated separately, while acid streams and cleaners which only require pH adjustment to drop out heavy metals are added in the final stage of precipitation.

In a typical cyanide destruct system, rinse waters are fed into a tank where the pH is maintained higher than 11 and sodium hypochlorite and chlorine is added to destroy the cyanide. The pH is controlled with a pH controller and metering pump, and the hypochlorite (Cl_2) is controlled with an ORP and metering pump. This tank discharges into a second tank where the pH is lowered to precipitate metal hydroxide. The overflow from the second tank will discharge into a flocculating tank or clarifier prior to final filtration and sludge compaction.

In a chrome reduction system, the first tank is maintained at a pH of less than 3 with sulfuric acid. Sodium metabisulfite (SO_2) is added with an ORP controller and metering pump to convert the hexavalent chrome to trivalent. The overflow is fed to another tank where the pH is raised higher than 8 to precipitate the chrome as hydroxide.

Properly sized tanks and mixers along with pH and ORP control systems are important components to ensure proper reaction and conservation of chemicals.

THE FINAL NEUTRALIZATION TANK

Neutralization may require additional pH control possibly with dual set point and metering pumps for acid and alkaline addition. Polyelectrolytes are often used to improve filtration efficiency or to aid settling, if this tank is partitioned or a separate clarifier is used. A pH recorder and flow meter are used to record the volume and quantity of the final effluent.

SOLID/LIQUID SEPARATION

Lastly, the precipitated metals are separated from the waste stream prior to discharge. This usually involves the use of a clarifier using a polyelectrolyte to enhance settling. The underflow stream, heavy in solids, is fed to a sludge conditioning tank and then through a sludge dewatering device.

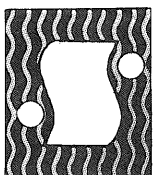
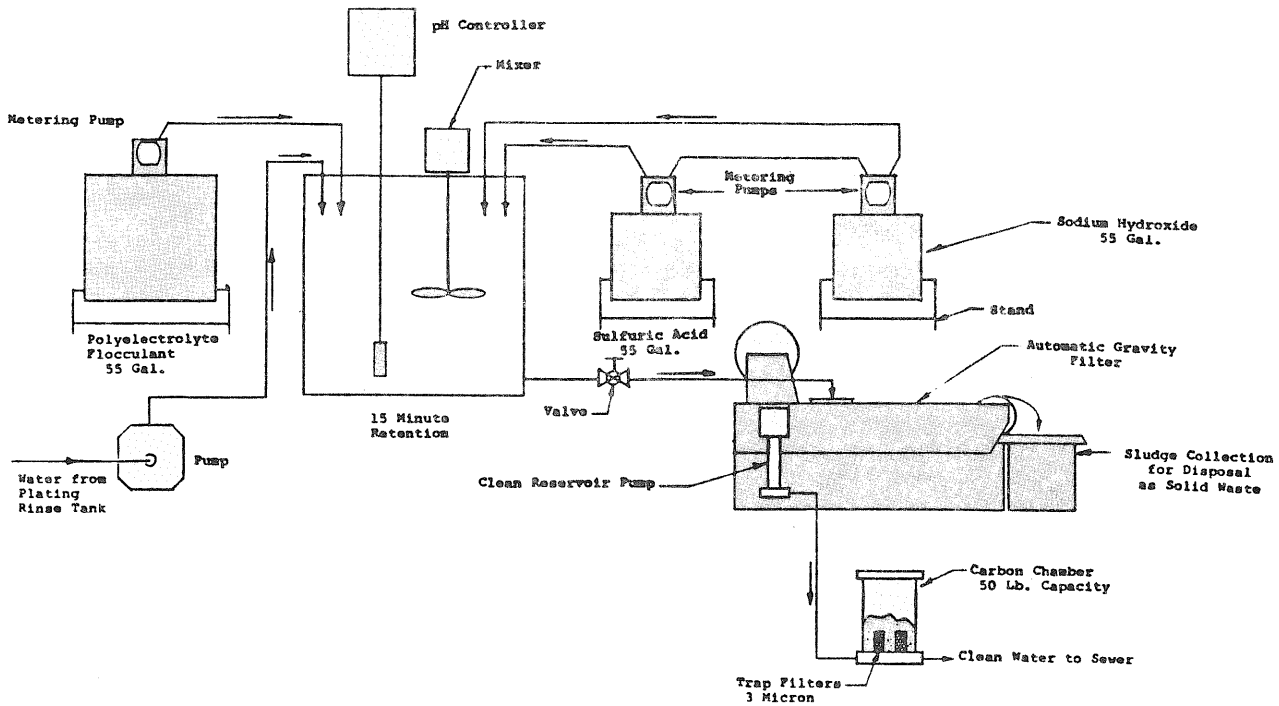
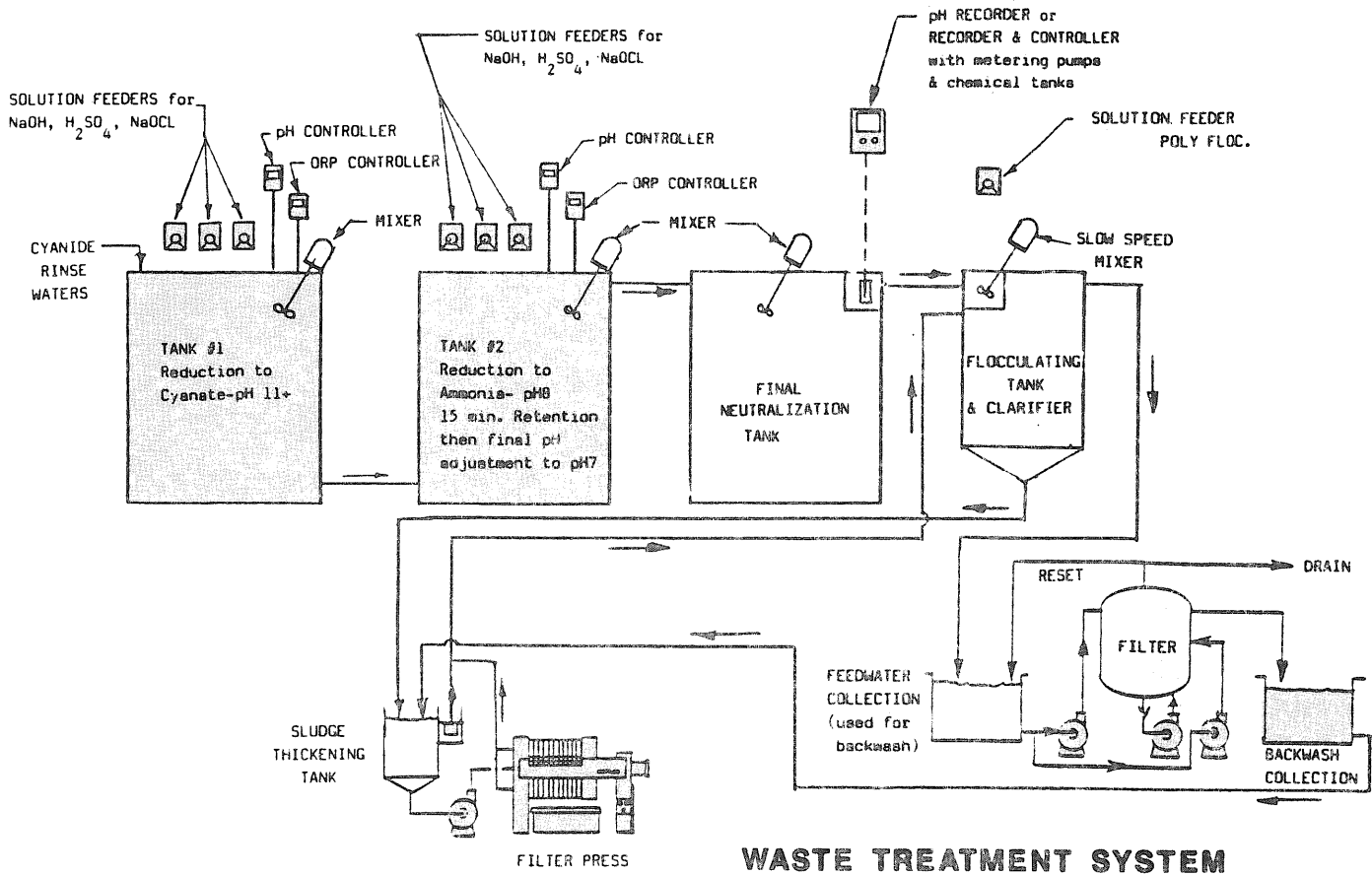
SLUDGE DEWATERING

The most common device used to dewater concentrated sludge is the Recessed Plate Filter Press. All non-metallic solution contact is preferred with center feed, and four corner discharge and blow-down manifold are basic configurations. Smaller units of a few cubic feet capacity are available with a Manual Hydraulic system. Larger units incorporate a semi-automatic hydraulic opening and closing system along with semi-automatic plate shifter. Sludge volume reductions of over 95% can be achieved.

FINAL EFFLUENT CLARIFICATION

Many waste treatment systems designed in the past are not meeting today's standards. Because of increased loading or stricter requirements, a final polishing filter is required on the clarifier discharge. The Sentinel 'BWM' filter offers an efficient automatic method of polishing this stream. The unique upflow design combined with a crossflow backwash cycle that utilizes unfiltered water from the clarifier has many advantages over traditional methods. No source of clean water for backwashing is required; therefore, the clarifier discharge flow is not interrupted during backwash. The system has the capacity for submicron filtration and it is completely automatic, reusing the permanent filter media.

For many systems the Automatic Gravity unit is a viable alternative, which will only consume media when solids are retained, automatically indexing new media when necessary. For systems with light dirt loads, or intermittent service during upsets, a cartridge filter could be economically utilized.



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