

## Case Study Metal Plating Rinse Water

A specialty metal plater in Santa Barbara, California faced continual scrutiny from the city sanitation district over rinse water discharge. The city discharge regulations, published violators exposure, and fines caused the other five metal platers to leave the city jurisdiction. Joe's Plating decided to recycle the rinse water to eliminate discharging water to the city sewer. Ray was tired of sleepless nights worrying about violating heavy metal and cyanide discharge limits.

The rinse water clean-up options included reverse osmosis, ion exchange, evaporation, and EC. The reject water from the reverse osmosis concentrated the heavy metals, creating a worse problem for heavy metal water discharge. Ion exchange required continual maintenance of the exchange resin. The maintenance cost to regenerate the resin was estimated to be 50% of the capital cost for the system each year or \$0.14 per gallon. The ion exchange capital cost was about the same as the EC capital cost. Evaporation produces a heavy metal ion powder and required about \$0.15 per gallon evaporated for energy. The evaporator capital cost was about three times that of the ion exchange or EC capital cost. EC converts the metal ions to an oxide from. The oxides can be separated from the water by settling tanks and filtration. Metal oxides can be disposed of in the regular landfill. The clarified and filtered water is reusable in the metal rinsing process. The EC operating cost is less than \$0.01 per gallon.

In September 2001 Joe's Plating installed a Powell Water Systems, Inc. 3-gpm EC system followed by decant tanks and filtration. The overflow water from the rinse tank is collected in a storage tank. The rinse water is processed through the Powell 3-gpm EC unit, decanted to separate the bulk of the solids, and the clear water is filtered before being recycled to the rinse water tank. The plating shop water use has been reduced from 800 gallons per day to 60 gallons per month, which includes one toilet.

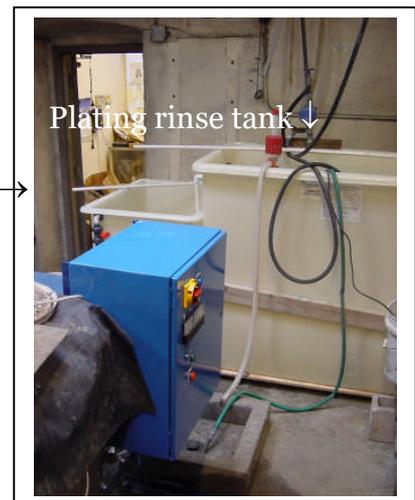
Joe's plating has a zero discharge permit. The sludge from the decant tanks is dried in an evaporator and stored in a container for disposal.



← Clarifying decant tanks

Surge tank for rinse water →

← Powell 3-gpm EC Unit →



Plating rinse tank ↓