ISO 9001:2015
AS 9100D
ISO 14001:2015
ISO13485
NADCAP

Water Reuse Program July 2024-2025

WATER REUSE STUDY

SAMPLE POINT →	Final Outfall (Waste Water)	Counterflow Stage 1 (Copper Plate)	Counterflow Stage 1 (Nickel)	Counterflow Stage 1 (Chrome)	Boiler Water Blow Down	Cooling Tower Blow Down
SAMPLE COMPONENT ↓						
A) Conductivity:						
B) Total Dissolved Solids:						
C) Total Chlorides:						
D) Total Sulfates:						
E) Alkalinity:						
F) Carbonates:						
G) Hardness:						

- South Carolina facility added an auto plating line 28 tanks at 176gls/tank. The line contains 14 process tanks and 14 rinses.
- The rinse tanks run at 0.25gl/minute water flow allowing approximately 2,100 gallons of water per 10 hour shift.


5.25 Brnz rinse
5.26 H


Acid waste

- The cost of water at $15.00 per thousand gallons makes it sound like it would not be profitable to reuse the rinse water. The issue is not the cost of the city water but the cost to waste treat and discharge the rinse water.
- The Lexington SC facility to discharge treated wastewater to the Cayce POTW our facility spends $0.03/gl on surcharges before we have even treated the water.
- 2100 gallons/day X .03= $63.00/day X 250 days = $15,750.00 savings.

- What do we do?
- Run a water profile
- Check for items Jim Collins stated on his water study.

Cations	Total mg/L ion	Dissolved mg/L ion		Anions	mg/L ion	
Aluminum (Al^{+3})	BDL	BDL		Chloride (Cl^{-1})	NA	
Barium (Ba^{+2})	BDL	BDL		Chromium (Cr^{+6})	NA	
Beryllium (Be^{+2})	BDL	BDL		Fluoride (F^{-1})	NA	
Cadmium (Cd^{+2})	BDL	BDL		Nitrate (NO_3^{-1})	NA	
Calcium (Ca^{+2})	BDL	BDL		Phosphate (PO_4^{-3})	NA	
Chromium (Cr^{Total})	BDL	BDL		Sulfate (SO_4^{-2})	NA	
Cobalt (Co^{+2})	BDL	BDL				
Copper (Cu^{+2})	2.36	2.31		Other Parameters		
Iron (Fe^{+3})	BDL	BDL		pH	2.20	electrometric
Lead (Pb^{+2})	0.860	0.86		Conductivity	9,340	µS/cm
Magnesium (Mg^{+2})	BDL	BDL		TOC	na	mg/L
Manganese (Mn^{+2})	BDL	BDL		Total Mercury (Hg^{+2})	BDL	µg/L
Nickel (Ni^{+2})	74.4	72.1		Dissolved Mercury	BDL	µg/L
Potassium (K^{+1})	13.7	13.7		TSS	3	mg/L
Silver (Ag^{+1})	BDL	BDL		Color	Clear	visual
Sodium (Na^{+1})	28.9	28.9		Cyanide (CN)	NA	Spot
Thallium (Tl^{+2})	BDL	BDL		Ferricyanide ($Fe[CN]_6$)	NA	Spot
Titanium (Ti^{+2})	BDL	BDL		Odor	None	
Tin (Sn^{+2})	BDL	BDL				
Zinc (Zn^{+2})	1.53	1.53		1) Treatment Goal: Water Reuse.		
				2) Treatment Flow: 3gpm, 20hrs/day, 4days/week.		
Arsenic (As)	BDL	BDL		3) Media Usage Estimate:		
Antimony (Sb)	BDL	BDL		- 130 gallons per 3.6ft^3 MB1 tank.		
Molybdenum (Mo)	BDL	BDL		4) Sample too concentrated for WWIX recovery.		
Selenium (Se)	BDL	BDL				
Silicon (Si)	BDL	BDL				
Vanadium (V)	BDL	BDL				
Free Mineral Acidity	NA	mg/L $CaCO_3$				
Total Acidity	NA	mg/L $CaCO_3$				
Free Carbon Dioxide (CO_2)	NA	mg/L $CaCO_3$				
NOTES:						
BDL = Below Detection Limit						
NA = Not Analyzed						
POS = Positive Spot						
NEG = Negative Spot						

- Metals good for recycling with Ion Exchange from plating line.
- Chlorides, sulfides, TDS among other things are good.
- Conductivity???
- Ion exchange will not work.
- What do we do now?

- Short term and long term solution.
- Short term electrolysis.
- This has allowed us to remove the metals and with a pH adjust and remove WWT cost.

- Long Term
- R/O after WWT to eliminate 95% of water going to the POTW. This will be completed by spring 2025.
- Why would you only eliminate 95% ?
- Minimum discharge amount and R/O discharge water.

- R/O system on final Discharge Water.

- This will allow our discharge of treated WWT to go from 8,000gls/day to 1,000gls/day. (POTW minimum amount and R/O discharge water)
- This will allow us a savings of $52,500 and we will reuse the purified discharge water.

Questions?