



Semiconductor Wastewater Disposal versus emew Treatment

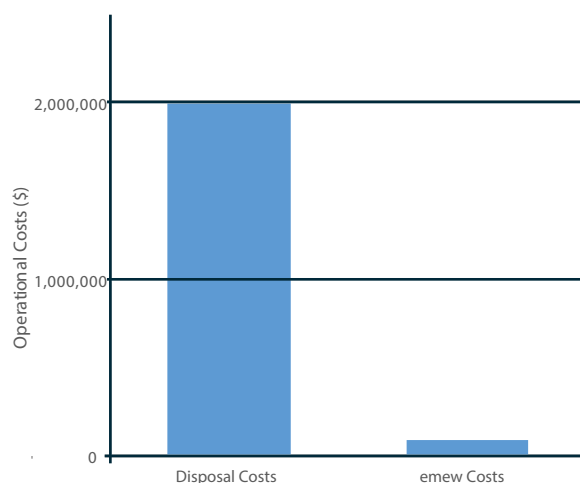
The semiconductor fabrication process includes several stages to produce semiconductor chips necessary in the production of electronics such as smartphones, GPS devices and computers.

In one particular case, a leading semiconductor manufacturer uses copper for its Back End of Line (BEOL) interconnects generating approximately **1,000,000 gallons of hazardous wastewater each year** with significant levels of:

- **Copper Sulfate** - 10,000 ppm
- **Hydrogen Peroxide** - 80,000 ppm
- **Sulfuric Acid** - 100,000 ppm

Previously this wastewater was disposed off site at a cost of **\$2/gallon**, resulting in **\$2,000,000 of disposal fees** each year.

Disposal Costs vs emew Costs



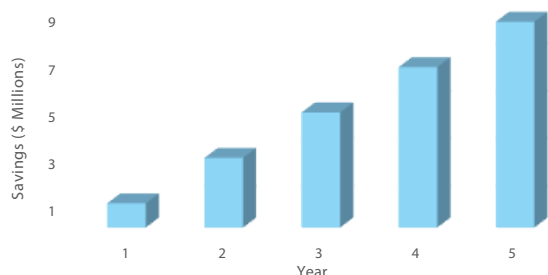
Looking to optimize operations, save costs and eliminate waste, the company installs an emew system to recover the copper from the wastewater and destroy hydrogen peroxide so the effluent can be treated in an existing effluent treatment plant (ETP).

Installed capital cost was **less than half the cost of the annual disposal fees** with annual operating costs (including electrical, labour, and maintenance) of less than \$95K.

By treating the wastewater instead of paying for offsite disposal, the company:




Savings over Time



- **No longer pays** for disposal, saving **\$2,000,000** per annum
- **Eliminated waste** to landfill embracing lean and green manufacturing
- **Recovering** 60,000 lbs of **saleable copper** each year as bonus revenue

After first year of operation, the savings amounted to \$1.9M per year with less than **6 month payback**, saving **millions of dollars** each year thereafter!

Disposal			
Wastewater (annual) in gallons	1,000,000	One-time Installed Capital Cost	\$ 950,000
Disposal fee per gallon	\$ 2	Recovered Copper (annual) in lbs	60,000
Total Annual Operating Costs	\$ 2,000,000	Total Annual Operating Costs	\$ 94,000
Total Annual Savings		\$ 1,906,000	
Payback Period		5.9 months	