

## NORCHEM ULTRAPURE CASE STUDY 1

### INDUSTRIAL LAUNDRY

#### PLANT / PRODUCT MIX TYPE:

- Industrial Garments
- Shop / Print Towels
- Mats
- Food Service Garments
- Bar Towels

#### CUSTOMER CHALLENGES:

- Very low compliance limit for BTEX and Oil & Grease.
- Water and sewer cost rising and notified of water cost increasing by 50% over the next three years.
- Sewer strength charges high and rising
- High energy cost

#### PROJECT RESULTS:

- Reduced the fresh water and effluent wastewater by 25,100,000 gallons (\$213,523) per year, equivalent to 81 metric tons of carbon dioxide emissions.
- BTEX and O & G levels are now well below the limits preventing future fines and NOV's.
- By recycling hot wastewater, the energy required to heat the water was reduced by 94,165 Therms (\$11,569) per year, equivalent to 500 metric tons of carbon dioxide emissions. This is in addition to the savings the laundry had implemented with the standard wastewater heat reclamation systems.
- The use of recycled water back into the process allowed the recycling of chemicals used in the process as well. There was a reduction of \$54,340 of wash chemicals annually.

#### PROJECT COST / SAVINGS:

- The implementation of the Ultrapure System resulted in substantial savings of \$312,000 with a capital cost of \$836,000 resulting in a payback of 2.5 years as described in the detailed cost analysis is attached showing cost before and after implementation as well as operational cost.
- The capital cost of the project was offset by local grant money given to companies to help offset the cost of water recycling capital.
- The implementation of the Ultrapure System not only resulted in substantial savings, it also demonstrated the company's commitment to protecting the environment by reducing Greenhouse Gas Emissions, and drastically reducing its consumption of water, the world most precious natural resource.
- After implementation the client has received environmental stewardship awards, as well as awards for wastewater compliance.

## ULTRAPURE CASE STUDY 1

### INDUSTRIAL PLANT (WATER / SEWER / SURCHARGE / GAS SAVINGS)

CURRENT USAGE AND COST				
Parameter	Unit Value	Monthly Volume	Monthly Cost	Yearly
<b>Wash Floor Production Information</b>				
Hours of operation per week	80	347		4,160
Wash Poundage	396,540	1,718,340		20,620,080
Fresh Water gal. /lb	1.82			
Washroom Chemical (CWT)	\$1.82	1,718,340	\$31,230	\$374,760
<b>Utility Cost</b>				
Electricity (\$/kWh)	\$0.0932	236,875	\$22,077	\$264,921
Natural Gas (\$/Therm) (total usage with delivery)	\$0.57	63,870	\$36,406	\$436,871
<b>Water Cost</b>				
Fresh Water (\$/1,000 gal.)	\$3.80	3,120,750	\$11,859	\$142,306
Softener Salt (\$/Month)			\$870	\$10,440
<b>Wastewater Cost</b>				
Wastewater (\$/1,000 gal.)	\$4.71	3,120,750	\$14,699	\$176,385
Wastewater Strength Charges (\$/1,000 gal.)	\$3.39	3,120,750	\$10,579	\$126,952
pH Adjust (\$/1,000 gal.)	\$0.26		\$800	\$9,600
<b>Total Operating Cost</b>			<b>\$128,519.58</b>	<b>\$1,542,234.90</b>
ULTRAPURE OPERATING COST				
System Parameters	Unit Value	Monthly Volume	Monthly Cost	Yearly
Wastewater flow (gpm/ gal./mon.)	150	3,120,750		37,449,000
Recycle Water Capacity of Fresh Water (%)	67%	2,090,903		25,090,830
Fresh Water gal. /lb	0.60			
<b>TOTAL WATER RECYCLING SAVINGS (gal.)</b>		<b>2,090,903</b>		<b>25,090,830</b>
<b>Operating Cost</b>				
Electricity (KWH/1,000 gal. Recycled)	\$1.36	30,426	\$2,836	\$34,029
Cleaning Chemicals (\$/1,000 gal. Recycled)	\$0.31		\$960	\$11,520
Liquid Waste Disposal (\$/gal.)	\$0.37		\$1,150	\$13,800
<b>Operating cost (\$/1000 gallons Recycled)</b>	<b>\$2.37</b>		<b>\$4,946</b>	<b>\$59,349</b>
ULTRAPURE SAVINGS				
Ultrapure System Economic Analysis	Unit Value	Monthly Volume	Monthly Cost	Yearly
Total Water Savings	\$3.80	2,090,903	\$7,945	\$95,345
Total Wastewater Savings	\$4.71	2,090,903	\$9,848	\$118,178
Total Wastewater Strength Charge Savings	\$3.39	2,090,903	\$7,088	\$85,058
Total Energy Savings (therms)	12%	7,847	\$964	\$11,569
Total Washroom Chemical Savings	15%		\$4,528	\$54,340
Total Water Softener Savings	67%		\$583	\$6,995
Total pH Savings (Acid)	67%		\$536	\$6,432
Water Saving Grants or Rebate				
<b>Total Savings</b>			<b>\$31,493</b>	<b>\$377,917</b>
<b>Total Net Savings</b>			<b>\$26,547</b>	<b>\$318,569</b>
<b>ULTRAPURE SYSTEM CASH PRICE</b>	<b>\$836,960.00</b>			
<b>WATER REUSE GRANT</b>	<b>(\$40,000.00)</b>			
<b>Net Cash Price</b>	<b>\$796,960.00</b>			
<b>Payback (Years)</b>	<b>2.50</b>			

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